The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Science and Life

THE proceedings of the British Association, concluded this week at Leeds, if they have disclosed no new doctrine or invention corresponding in importance to Darwin's theory of the origin of species or to Perkin's discovery of the first aniline dye, have nevertheless demonstrated the vital and constant contact that exists between the work of the remote researcher and the whole bundle of problems and interests summed up in the word civilisation. It is well that the public, once a year at least, should be reminded of their indebtedness to the men of science who are thus constantly at work on their behalf. For, though the inventor's genius may be sometimes commercially exploited, and the rewards given more to others than to himself, in the end it is the general community that benefits from some cheapening of its necessities and pleasures, from new conveniences in home or business or travel, from additions to its joys and recreations, and not least of all from the alleviation of suffering, the cure of disease, and the promotion of healthier and happier life. If everything of this order that a normal citizen enjoys almost every day of his life, to a large extent unconsciously, could be traced to its source, it would be found that he owed it to science, and to no branch of science more than to chemistry. The good Press that the British Association invariably gets is not due, as so many suppose, to journalistic resource and ingenuity in making dull things look attractive. It is due to the fact that the work of these remote men of science is in such vital contact with life, and that when they emerge with a few of the results once a year the trained Press intelligence sees the human interest of it all, and just acts as lay interpreter to the public.

From the scientific as distinct from the lay point of view, the Leeds meetings, as we have said, mark the opening of no new chapter in invention or knowledge and introduce no great personality, but they show the general standard of science to be high and the spirit that inspires the quest of new knowledge to be as keen as ever. This general description may apply roughly to the Chemistry Section, in which our readers are more particularly interested. Looking back over the week's discussions, what is the total effect and impression left on those who followed them? The Association exists for the advancement of science and the propagation of a knowledge of it. When it visits a great industrial city such as Leeds, however, a new point arises, for it comes into direct contact with those at whose hands the findings of science are to be translated into the service of the daily needs of mankind.

In this respect the Association, at such times, forms a bridge between science and industry. Those of us who wish the brilliant work of the scientist to add as much as possible to the sum of human happiness may watch such meetings anxiously. The people of Leeds showed in the plainest possible way that for their part they intend to make the fullest use of this bridge. The feeling of the burgesses was indicated by the fact that the Lord Mayor presided at the opening meeting, and that the Town Hall formed what Sir Oliver Lodge described justly as the best reception room he had ever known. The feeling of the industrial leaders was shown by the fact that during the week the members of the Chemistry Section were afforded opportunities of visiting no fewer than four chemical and allied works. It may be added that these visits proved a revelation to most of the visitors. They had read of the great advances made in chemical engineering and of the use of accurate control apparatus in industry, but most of them had no conception of the real meaning of these things. At Leeds they were enabled to see enormous plant of the most up-to-date type handled with the greatest efficiency, and other signs that the British chemical manufacturer has no intention of lagging behind his foreign rivals.

The effect of all this on the pure chemist was obviously very salutary. His own work is on such a different scale, that, quite unconsciously, and through no fault of his own, he is apt to lose touch with the

utterly different problems presented by big-scale work. A visit to a great works, where the operations are clearly demonstrated, has a most important effect in helping the pure chemist to keep a sense of reality. Those who so generously threw open their works to public view and gave their time to the demonstration of processes must have found some reward in the fact that the visitors were plainly impressed by all they had seen. This feeling of friendly intercourse between science and industry stood out very clearly in the special textile meetings. Through the papers read, the visits to dyestuff works, and the exhibits at the Research Association for the Woollen and Worsted Industries, the visitors were enabled to get a composite view of a modern industry from every aspect ; not only the technical aspect, but also that of the application of research to industry. Though we are dealing at the moment with the Chemistry Section, mention may also be made of the discussion, held under the auspices of the engineering section, on various aspects of the coal question, for it was in the very capable (and chemical) hands of Dr. Lander and Professors Cobb and Wheeler. The value which was attached to this discussion in Leeds was evident from the Press comment which followed it.

The importance of the interactions of science and industry has been stressed above because the meeting offered an excellent opportunity of observing them. As regards pure chemistry, there can be no doubt that Dr. Sidgwick has carried out a valuable piece of missionary work, and it is probable that the effect will very shortly show itself in British chemical literature. In the circumstances it must have been a matter of especial gratification to the members of the Chemical Section that Dr. Sidgwick was among those singled out by the University of Leeds as the recipient of an honorary degree.

The Liljenroth Process

THERE can be no doubt that the volatilisation process for the production of phosphoric acid has assumed increasing importance since some of the details of the Liljenroth process were disclosed. The electric furnace is operating at Piesteritz, and the result is a daily production of 70 tons of phosphorus. It is not proposed to oxidise this at the works where it is produced, but to transport it to Wolfen-bei-Bitterfeld for conversion to phosphoric acid.

Our readers will recall that the basis of the process depends on the collection of the phosphorus evolved from a mixture of phosphate rock, silica, and coke which is treated in an electric furnace, and its subsequent oxidation with steam in the presence of a catalyst. The reaction is represented thus :—

$$P_2 + 5H_2O = P_2O_5 + 5H_2.$$

The phosphorus pentoxide is converted into phosphoric acid, and the hydrogen which is obtained as a by-product is used to produce synthetic ammonia, which in turn is absorbed by the phosphoric acid and converted into diammonium phosphate. While the practicability of the volatilisation process is said to have been established with a small plant at Niagara Falls, other investigators have found that the complete collection of phosphorus requires an elaborate condensing system, which would add appreciably to the cost of the final product. Irrespective of this, it appears that the ease with which most catalysts are poisoned makes it doubtful if complete oxidation of the vapours will be achieved on treatment with steam, unless special precautions are taken to avoid contamination of the catalytic agent. It is believed by some that it is preferable to resort to direct oxidation of phosphorus by air, and to dispense with the idea of producing hydrogen, which arises as a by-product when steam is used.

Recent research has shown that another stage of the process in the production of diammonium phosphate is not nearly so easy as one would be inclined to imagine. It is comparatively simple to produce mono-ammonium phosphate from ammonia and concentrated phosphoric acid, but the manufacture of the di-salt presents difficulty. The heat evolved when ammonia is passed into strong phosphoric acid is considerable, and prevents the absorption of the full quantum to yield the diammonium product. A stage midway between mono- and diammonium phosphates is reached. If one attempts to secure increased absorption of the ammonia by cooling, the whole mass solidifies, and thus the combination of sufficient ammonia to yield the di-salt is rendered impossible. Clearly, the German technicians have found means of circumventing these difficulties, but the published patents, as is not unusual, are singularly nebulous on the whole subject.

German Work on Synthetic Fuel

SOME indication was given a few weeks ago of the vigorous work that is going on in Germany on the production of synthetic liquid fuels. Additional information has been revealed by the United States Trade Commissioner in Berlin, Mr. W. T. Daugherty. The large plant at Merseburg, in the centre of the lignite region, is to employ 15,000 men, and the scale on which operations have been planned indicates the confidence felt in the results. As far back as last April began the production of oil from coal, under high pressures and temperatures, based on the Bergius principle, and the American estimate is that this achievement ranks with the production of aniline dyes and synthetic nitrogen. It is estimated that the production of a sufficient supply of synthetic fuel would save Germany about 200 million gold marks a year, the value of current imports, or, approximately, what Germany paid before the war for its Chile nitrate.

The coal, it is stated, is reduced to a fine powder, to which 30 per cent. of coal tar is added to produce a thick paste. The mixture is heated in a reaction chamber to a temperature of about 400 to 500° C., and hydrogen is introduced while a pressure of about 200 atmospheres is maintained. A ton (1,000 kilos) of coal is said to yield about 490 kilos oil, 210 kilos gas, and 300 kilos pitch residue. The gas is supplied to consumers, and the pitch also finds commercial application. The first-run oil is then distilled, 490 kilos yielding 350 kilos of fuel oils, 60 kilos of burning oil, and 50 kilos of lubricating oils. The motor fuel can be further refined, an amount of 350 kilos yielding 150 kilos gasoline and 200 kilos Diesel oils. It is

striking, Mr. Daugherty remarks, to compare with this yield a recovery of only 30 kilos of tar and 10 kilos of light oil from a ton of coal subjected to low-temperature distillation.

The I.G. holds the exclusive right to operate the Bergius patents for the hydrogenation of lignite, but shares with the Kobergrin Aktien-Gesellschaft the right to operate the black coal hydrogenation processes. Among the chief figures in the Kobergrin are Dr. Spilker, a leading Ruhr coal magnate, who is also head of the Gesellschaft fur Teeverwertung, of Duisburg-Meiderich, which has announced plans for the erection of a black coal hydrogenation plant, utilising low-grade Ruhr coal dust and waste hydrogen from coke-oven gases. This concern is said to control the larger part of Germany's total coal tar production.

Nitrogen Output and Consumption

THE improvement in modern chemical processes, and especially the substitution of synthetic products in large quantities for natural sources of supply, is producing in many directions a danger that output will overtake and outrun consumption. The balance is usually restored in time, but modifications are inevitable in the process. Just now, from what we hear from American investigators in Europe, chemical authorities over there are a little exercised by the promise of greatly increased production of synthetic nitrogen. In America this is marketed in the anhydrous form, and scarcely any of it is converted into sulphate, the American fertiliser market deriving its supplies almost entirely from by-product sources. But American industry cannot continue indefinitely to absorb anhydrous ammonia, the supplies of which are more than ample, and it looks as if conversion into sulphate, or its use as a constituent of some complete type of plant food, may soon become imperative. That will raise the further problem of the education of the American farmer in the use of chemical fertilisers, and already he shows signs of distinctly conservative tendencies. In this field at least Europe seems considerably ahead of the United States in production, use, and export trade. Perhaps some day America may be an active competitor for export markets, but that cannot be very soon, and for the moment American chemical industrialists are chary about entering this field, until it is clear that the Government have dropped for good the Muscle Shoals scheme.

Engineering and Machinery Exhibition

THE Shipping, Engineering, and Machinery Exhibition, which opened at Olympia on Thursday and will continue open until September 24, is of considerable interest to chemical, chemical engineering, and metallurgical interests, which are well represented in the exhibits. Official visits to the exhibition have been arranged by the Institution of Chemical Engineers, the British Chemical Plant Manufacturers' Association, the Society of Chemical Industry, the British Cast Iron Research Association, the Institute of Metals, the Institution of Mining and Metallurgy, the Institution of Fuel Technology, and several other bodies. While a large proportion of the exhibits on view will be standard plant and plant materials of the excellent types for which this country is known throughout the world, visitors will find a number of new features which progressive firms cannot afford to miss. One example of this is contained in the notes published in this issue on "Crawshaw's Chemical Colander," a British invention which has been taken over by Imperial Chemical Industries, Ltd., and which is said to effect an astonishing saving of time in the degreasing of machinery parts. The process involves the use of a special chemical substance named "Crawshawpol." The comprehensive catalogue, which includes a large number of familiar names, promises a representative collection of exhibits of immediate interest to all concerned in the chemical, engineering, and metallurgical industries.

Sir Edward Brotherton's Example

SIR EDWARD BROTHERTON'S gift of £100,000 to the University of Leeds towards the erection of new library buildings, announced by the Duke of Devonshire on Tuesday, is not the first evidence of the donor's interest in the work of the University. Five years ago he gave £20,000 towards founding a Chair of Bacteriology and encouraging bacteriological research in the interests of public heath, and from time to time he has similarly demonstrated a generous public interest in educational and social movements, as well as in the welfare of his own employees. A gift of this character constitutes an excellent public example to successful leaders of industry—firstly, because it shows that the successful management of a great scientific and industrial business need not exclude the claims of citizenship, and secondly, because it demonstrates that material success in business is not the purely selfish and sordid affair that it is often represented to be, but more often assumes the character of a public trust. To the chemical industry, in which Sir Edward Brotherton has long been a distinguished figure, it will be a matter of pride that this handsome example should have come from one of its members, and that the tradition of public benefaction and service, already well established in the industry, is being so handsomely maintained.

Book Received

ELEMENTARY PHYSICAL CHEMISTRY. By Hugh S. Taylor, D. Sc., London: Macmillan and Co., Ltd. Pp. 531. 16s.

The Calendar

Sep. 8–24	Shipping, Engineering and Machinery Exhibition.	Olympia, London, W.
10	Society of Leather Trades' Chemists: British Section. 10 a.m.	Leathersellers' College, 176, Tower Bridge Rd., London.
13	Visit of the Society of Chemical Industry to the Shipping, Engineering and Machinery Exhibition. Reception. 4.30 p.m.	Olympia, London, W.
21	Inauguration of Research Station and Laboratory of the Research Association of the British Paint, Colour and Varnish Manufacturers.	Clarence Hotel, Teddington.
23–26	Association of Special Libraries and Information Bureaux. Fourth Conference.	Trinity College, Cambridge.
24–Oct. 6	World Fuel Conference.	Imperial Institute, South Kensington, London.

Chemical Problems at the British Association

Some Impressions of the Discussions

(From Our Own Correspondent)

Leeds, September 7.

If there is a special Valhalla of Chemists, to which they all go when they die, then sooner or later it will contain a memorial dedicated to the Corporation of Leeds. The members of the British Association for the Advancement of Science, on first receiving the badge of membership, probably feel rather self-conscious when they put it on. Any feeling of awkwardness, however, vanishes when it is revealed that possession of this badge enables the wearer to travel free on the Corporation tramways for the whole week of the Association's meetings. Virtue is its own reward; and chemists, being therefore poor men, find it hard to repress a tear of gratitude for this tempering of the wind to the shorn lamb. One member of Section B (he must have been an expert on costing) thought that the Corporation would be bankrupt by the end of the week. Shortly afterwards, finding that one of the tram routes was a circular one, he seemed to be of the opinion that he could spend the week cheaply and pleasantly by boarding a car on this route and staying on it. As, however, he has since been seen at various meetings, it is to be supposed that the fresh air proved too strong for him.

The Section "B" Presidential Address

Dr. N. V. Sidgwick's appearance as president of the Chemistry Section was greeted by a crowded lecture hall. Printed copies of the presidential address having been handed to the members of the audience, the president began by asking, in the words of Dr. Johnson: Why should a man go to hear that imperfectly at a lecture which he can read much better in a book? He pointed out that if he read the address as printed (which the audience could do perfectly well for itself) he would be interrupted at intervals by a loud rustle as all his hearers simultaneously turned over each page. Perhaps, also, he had unpleasant recollections of having sat through ordeals of this kind himself; of finding his attention hopelessly distracted between the written and spoken word; and of finally saving himself from boredom (as many others have done) by devoting his time, not to the appreciation of the lecture in progress, but to efforts to detect and criticise the speaker's variation from the text. Be that as it may, Dr. Sidgwick did not read the address. He devoted three-quarters of an hour to discussing the main points in it, thus, as he said, leaving more time for the discussion on co-ordination which was to follow it and the subsequent papers.

The points raised by Dr. Sidgwick make it clear that no chemist who wishes to be a master of his subject can succeed unless he has a knowledge of two things. The first is the general outline of Werner's theory of co-ordination, which must be thoroughly mastered. The second is the modern theory of the structure of atoms. It is not to be expected that chemists as a class should know the details of Schrödinger's wave mechanics or the higher flights of the quantum theory. Few of them have the necessary time to devote to the subject—fewer still the necessary mathematical equipment. The more general details of Bohr's theory and of Lewis's views on the electronic explanation of chemical combination (which have, of course, been much amplified since they were originally put forward) are within everybody's intellectual range. Armed with a knowledge of the co-ordination theory and of the electronic explanation of it, the chemist is able to understand clearly much that is otherwise hopelessly inexplicable. On the inorganic side, the co-ordination theory plays the part of every great generalisation: namely, it takes an enormous number of facts and details, which are otherwise a mere useless strain on the memory of those who take the trouble to learn them, and turns them all into special cases of a few very general (and easily memorised) rules. In the hands of Werner, the application of this theory led to most striking advances in the realm of stereochemistry. Given its proper place in the framework of chemistry, it is more than likely that the theory may result in revolutionary advances in knowledge. There is no doubt that in the past many research workers have boggled at the idea of attacking the problems presented by complex salts simply because there seemed to be no useful purpose to be served in simply adding yet more and more to the number of such salts already known. As soon as the matter is regarded from the point of view of Werner's ideas, it immediately assumes an entirely different aspect. Once this is realised, this department of chemistry will probably attract a large number of workers, with results of a very important nature.

Co-ordination in Organic Chemistry

This, however, is only the inorganic side. Even to the eye of the enthusiast, the compounds of carbon, which have hitherto yielded important and consistent results simply on the basis of the old structural theory, do not appear to be a very promising field for the application of Werner's views and their recent development. Dr. Sidgwick, however, urged that the theory should also be applied to the organic side. The co-ordination possibilities offered, for example, by the oxygen atom, explain much that was previously puzzling in regard to the association of organic molecules. Moreover, Dr. Sidgwick showed, in a simple instance, how the theory could help in the investigation of the reactivity of organic compounds.

Dr. G. T. Morgan, of the Teddington Chemical Laboratory, who followed Dr. Sidgwick, dealt very largely with the organic side. As he pointed out, Werner had noticed the relation between inorganic co-ordinated compounds and the lakes formed from dyestuffs. Dr. Morgan and his collaborators, in a series of papers published in the last few years, have shown how the co-ordination theory applies here, and in particular Drs. Morgan and Main Smith have shown that every acidic mordant dye must contain a group which can co-ordinate with the metal of the mordanting compound.

The immediate utilitarian applications of a theory are necessarily ignored by its author. His business is to evolve a sound generalisation to cover the largest possible body of facts. At the same time, it is obvious that a theory which can be applied with success to the structure of colour lakes may easily have, sooner or later, important effects on this and other branches of industrial chemistry.

It is impossible to close this section of these notes without some reference to the remarks made by Professor H. B. Dixon in seconding the vote of thanks to Dr. Sidgwick. It was, we believe, an Oxford tutor who adjured his students, if the spirit ever moved them to speak in public, "to stand up, to speak up, and to shut up." Professor Dixon, whether he had heard of this advice or not, lived up to the spirit of it in a speech of remarkable pithiness and elegance. In regard to the question of the reading of presidential addresses, he mentioned that he had attended a British Association meeting many years ago in Oxford in order to hear the words of wisdom of Professor Brodie. Brodie, however, failed to read his address; with genuine thoroughness, he also failed to write it. Perhaps, remarked Professor Dixon grimly, this was because at that time it seemed against the etiquette of the Oxford professorate to lecture at all!

Colloids

In the joint discussion on the nature and properties of colloids the chemists and physicists joined forces. Sir William Bragg dealt with the possible assistance which might be given by the method of analysis with X-rays to the inquiry into the nature and properties of colloids. He pointed out that there were five points on which knowledge was desired: (1) The internal structure of the particle, whether it had a periodic arrangement, and the nature of the arrangement; (2) The nature of the exterior layers of the particle; (3) The average size and size distribution of the particles; (4) The general form of the particles; and (5) The extent of any tendencies to orientation among the particles. The X-ray method of analysis, he said, was wholly dependent on the existence of ordered arrangement within the bodies examined. However, this limitation was not so severe as it seemed.

Even liquids, interposed between a pencil of X-rays and a photographic plate, gave rise to a ring on the plate; hence some ordered arrangement was present, due possibly to molecular association, arrangement of the atoms within the molecule, etc. X-rays formed a picture when passed through a colloidal preparation. This picture might be so simple that the actual structure could be deduced at once, as in the case of colloidal gold investigated by Debye and Scherrer. In cellulose, X-ray analysis showed that the unit contained four molecules, but nothing was known as regards their mutual arrangement. As regards the question of the orientation of the particles in a colloid, there was, for example, the case of rubber. Investigated by means of X-ray analysis, rubber showed the appearance of crystallisation as soon as it was stretched; on removal of the stretching force, the rubber reverted to a form in which apparently no crystallisation was present. A vast number of substances, fibres of all sorts, the structure of living organisms, bones, muscles, and the like, metals under strain, etc., all showed by their effects on X-rays that they contained minute assemblages of crystals, more or less oriented in the direction of growth or strain. Such effects had been studied most widely in connection with the deformation of metals under heat and stress, because the application to important industrial questions was so obvious and important.

Professor H. Freundlich, the eminent German colloid chemist, was present at the discussion, and dealt with the X-ray method of analysis; the factors influencing the structure of a colloid particle; and the determination of the shape of colloid particles (pear-, spherical-, and rod-shaped and of plate-form) by optical methods. Growing interest has been taken in the last few years in aerosols, *e.g.*, smokes, fogs, etc., in which a solid or liquid substance is colloidally dispersed through air or another gas. Professor R. Whytlaw Gray has carried out a number of investigations on the particles in smokes, and described the results which he had obtained.

Visits to Works

Lest the members of Section B should lose touch with the solid material realities of life in the rarefied atmosphere of discussions on pure chemistry, they are brought back to earth each afternoon by a visit to a works. There can be no doubt about the popularity of these visits, which in at least one case had to be duplicated in order to permit of the attendance of all who responded to the invitation. The visit to Hickson and Partners, Ltd., at Castleford (which is described at greater length in the Dyestuffs Supplement), was combined with one to the Yorkshire Coking and Chemical Co., Ltd. At the latter, the visitors saw the production of metallurgical coke from coal in Koppers coke ovens, together with the recovery of the by-products from the volatile products of the coking process. The following processes were seen in operation: The mechanical washing of the coal, the coking, the scrubbing of the gases to remove benzene and other derivatives, the extraction of ammonia and the conversion of the latter to sulphate.

Another party visited the soap works of Joseph Watson and Sons. The works are situated on the River Aire. The oils for soap-making are elevated to the roof and then slowly passed down through the various departments by gravity. All the operations were shown including boiling with alkali, the salting, and the cooling of the molten soap in frame and mould coolers. In the glycerine and salt recovery department were seen the distillation of the lye (containing 5 per cent. of glycerine) under reduced pressure, salt separating out, and 85 per cent. glycerine being obtained, which is further purified by the users to whom it is sold.

The Chemistry of the Hormones

The hormones we have always with us. "The Chemistry of the Hormones" has become something of a serial story. Chapter One took place at the Congress of Chemists held in London last year; Chapter Two at the recent meeting of the Society of Chemical Industry in Edinburgh; and Chapter Three at the meeting now under discussion. The reason, of course, is that as our knowledge of these substances and their functions increases, they seem to loom larger and larger in the scheme of things: not only because of their intense potency (speaker after speaker emphasised the question of the small quantity required to give marked effects) but also of the remarkable nature of the results due to their action. The discussion on Monday was begun by Professor Barger. He announced at the outset that he had no intention of stating what was already known, but of dealing with things which were still doubtful or debatable; and went on to intimate that as the British Association meetings were eminently a place for free discussion, he had no intention of lending an air of polite banality to the proceedings. The audience received this intimation with applause: most of them, probably, because they were hopefully looking forward to any excitement that might arise; the rest because, surveying the Professor's large dimensions and many inches, they felt that he would be a dangerous man to quarrel with.

At the outset Professor Barger outlined rapidly the history of our knowledge of the only two hormones which have been synthesised in the laboratory—adrenalin and thyroxin (the latter, as is well known, having been the object of considerable research by Barger and Harington, who have recently synthesised it). An interesting point (hitherto, we believe, unpublished) emerged in the fact that Dr. Harington has resolved synthetic thyroxin, which is an optically inactive mixture, into its optically active dextro- and lævo-rotatory isomers, these isomers showing no great difference in their physiological actions. In order to illustrate the physiological side of the subject, slides were shown illustrative of the remarkable effects to which removal of the thyroid gland from various animals gives rise. One of these showed a cat, which, as a result of the absence of the gland, sat in a friendly manner with a group of mice. This picture was well received, and will probably cause intense thought among all chemists occupying more or less subordinate positions: university lecturers will probably consider that thyroidectomy should be practised on their professors; while works chemists will be of the opinion that their managers would greatly benefit by it.

Insulin

Having dealt with adrenalin and thyroxin, Professor Barger passed on to the other hormones. He touched for a moment on the hormones of the pituitary body, one of which, he thought, was the substance which permitted the chameleon to change its colour. Finally he came to the burning question of insulin. This differs from adrenalin and thyroxin in that it has not yet been purified and crystallised with certainty, which, from the chemical point of view, is an essential step in the elucidation of its structure. Professor Abel, the American biochemist, claims to have obtained it in a pure and crystalline condition, but Professor Barger adduced reasons for the belief that this claim needed confirmation. Possibly, he thought, the great physiological activity of the specimens was not necessarily due to the production of pure insulin: it might be that the substance was merely adsorbed on the surface of some impurity.

The views of Mr. F. H. Carr on this subject would have been of great interest. Unfortunately, he was prevented from attending the meeting, but in a letter he stated that in the laboratories of the British Drug Houses work on insulin was being carried on along the lines indicated by Abel. A product of greater potency than that obtained by other means had been prepared; and the present intention was to repeat the work on a much larger scale, in order to obtain products for further investigation.

From the remarks made by various speakers it was clear (as indicated above) that the great difficulty arising in work on the hormones is that they manifest their effects when present even in traces. Illustrating this point, Professor J. C. Drummond related how he had prepared a specially pure sample of cholesterol for irradiation with ultra-violet light, in connection with the work which has been carried on as regards the production of vitamins by this means. Later on, Professor Heilbron, of Liverpool, showed by investigation of the absorption spectrum of this cholesterol specimen that it probably contained a minute trace of another substance, to which all the results obtainable by treatment with ultra-violet light could be referred.

The Exhibition of Scientific Apparatus

In connection with the meeting, an exhibition of scientific apparatus was held in the crypt of the Town Hall. The British Hanovia Quartz Lamp Co., Ltd., showed, among other things, a dye testing lamp for tests of the fading effect of light on paint, dyed fabric, etc. The Foster Instrument Co. included in their exhibit a very novel thermo-couple pyrometer

in the form of a sparking plug functioning exactly like an ordinary one. This permits of the measurement of the mean gas temperature in the cylinders of an internal combustion engine, thus providing an indication of the power distribution among the different cylinders, and the heat stresses experienced by the cylinder walls, valves, etc. From the initial tests made with this instrument emerges the fact that the exhaust valves of an ordinary motor car engine of high efficiency are red-hot at full throttle and full load. John J. Griffin and Sons, Ltd., and Baird and Tatlock, Ltd., had a stall at which the exhibits included the Bell Meter for gas, designed by Professor C. V. Boys; pyrometer recording and indicating outfits; and numerous other pieces of apparatus. Attention may be particularly drawn to a double stage condensation mercury pump, worked by L. Dunoyer's system, which was included in the exhibit. Objects of chemical interest on the stand of Charles Hearson and Co., Ltd., were drying ovens, water baths, hot plates, etc. Negretti and Zambra showed a number of recording instruments. A large Eötvos torsion balance, complete with metal tent, used in the location of subterranean deposits of oil and minerals, was the main feature of the stand of L. Oertling, Ltd. Various optical instruments, including a microscope having a micro-camera attachment for photomicrography, were shown by Ogilvy and Co. The Tintometer, Ltd., showed Lovibond's tintometers and kindred colour-measuring apparatus. Apparatus for micro-analysis, including some described by Professor Pregl, was to be seen at the exhibit of Standley, Belcher and Mason, Ltd., who also had jacketed Buchner funnels, etc.

Activities of the Wool Research Association

The special sessions held for the discussion of textile subjects, in which members of the British Research Association for the Woollen and Worsted Industries took a prominent part, dealt in part with dyestuffs, and in this respect are noted in this week's dyestuffs supplement. Among the papers was one dealing with "Moisture Relations of Colloidal Fibres," by Dr. J. J. Hedges, in which was discussed the manner in which textile fibres absorb water from the atmosphere and the effect of the water on the properties of the fibre. Incidentally, the Research Association has designed a control (which is now undergoing factory tests) for the maintenance of constant humidity in wool mills.

Mr. A. T. King dealt with "Some Chemical Aspects of Wool Research." He gave an indication of the energetic manner in which the chemical department of the Research Association was carrying on its work. For example, the scouring of wool is complicated by the question of the recovery and disposal of natural wool grease (of which merino wool may contain a quantity nearly equal in weight to the clean wool itself). The absorptive power of wool for various reagents, and the effect of the latter on the subsequent operations to which the wool is subjected, have been studied, with the result that it has been shown that manufacturing faults may be prevented by obviating certain reagents and by the proper application of the right ones. Of outstanding importance are the results of the work on alkali sorption and its effects, which have previously been noted in THE CHEMICAL AGE. Attention may be drawn to the method devised for removing the scales and outer layers of fibres, leaving the inner portion intact for separate investigation from both the chemical and physical standpoints, which makes possible further advances towards understanding the fundamental properties of the wool fibre.

Mr. H. R. Hirst, in a paper on "Ultra-Violet Radiation as an Aid to Textile Analysis," dealt with an apparatus (produced by himself in collaboration with Dr. S. G. Barker at the Research Association) for the examination of specimens of various kinds in ultra-violet light. This instrument, apart from its important applications to the examination of dyed fabrics, has very interesting possibilities as regards chemical analysis. The titration of coloured or turbid solutions, which normally presents difficulties, may be effected by using as indicators substances which fluoresce in ultra-violet light. Aqueous solutions of α- or β-naphthol or quinine sulphate serve as excellent indicators, giving definite changes in the colour of the fluorescence at the point of neutrality. A convenient form of apparatus for conducting such titration has been devised so that they can be carried out in the laboratory without a special darkened room.

Discussion on Coal

The engineering section of the Association held a discussion on coal. Dr. C. H. Lander dealt with "Our Available Coal Supplies and Their Utilisation," while papers were also read by Professors J. W. Cobb and R. V. Wheeler. One of the questions raised in the discussion was that of the smoke evil, and Dr. Lauder stated that the problem now being tackled by the Fuel Research Board was not at the moment industrial smoke, but domestic smoke, which was far more important.

Next Year's President

At a meeting of the general committee of the Association held on Tuesday, Sir William Bragg, F.R.S., was elected as president for the year 1928–29. He will be installed in succession to Sir Arthur Keith at the meeting to be held in Glasgow next summer.

The Cut in Sulphate Prices

To the Editor of THE CHEMICAL AGE.

SIR,—My attention has been drawn to the paragraph on page 205 of your issue of August 27, in regard to the cut in sulphate of ammonia prices.

I send you herewith a copy of our circular letter dated July 31, in which it is clearly stated that "Our new price for August represents a reduction of £2 8s. per ton, or nearly 20 per cent., compared with the price for last spring."

It seems to me that the remarks of your correspondents, while quite correct, are somewhat beside the point. To the farmer who has been paying £12 6s. per ton for sulphate of ammonia during the spring-consuming season, and who was told on July 31 that the new price for August delivery was £9 18s. per ton, the reduction would surely present itself as a fall of £2 8s. per ton, or 20 per cent.—Yours, etc.,

NITRAM, LTD.,
F. C. O. SPEYER, General Manager.

September 5, 1927.

Valuable Products from Sharks

THE steamship *Istar*, now docked in London, is equipped with plant for tanning the hides of sharks and extracting products from their bodies. The hides were brought from Carnarvon, in Western Australia, where sharks are so numerous that a motor-boat crew caught 183 tons in 103 working hours. There is no lack of these fishes of prey. It has been estimated that over a million sharks a day in the course of migration pass between Fire Island and Cape San Roque, and there are in addition prolific fishing grounds off the coasts of India and the East Indies. Dr. Ehrenreich explained in the course of a demonstration that the *Istar* carries 170 nets made of linen hemp, and the actual fishing is done by ten motor boats. The sharks really destroy themselves, for when they enter the nets they continue to thrust forward and thus close their gills. The effect is to suffocate them. The industry has grown so rapidly that the *Istar* is now used as a training and demonstration ship, although it is proposed to fit out other vessels as floating factories and to establish land tanning factories. The products obtained from the sharks are said to include leather from the hide, soft leather for fancy goods, pigments, glue, fertiliser, insulin, a tensile fibre, and a medicinal oil from the liver.

Resumption of the Fleet Street Tours

A VERY numerous attendance marked the resumption of the series of Fleet Street tours on Wednesday, under the able guidance of Mr. Allen S. Walker. St. Paul's Cathedral was the object of this tour. Mr. Walker was able to point out the remains of the old cloisters still standing in the present churchyard. Passing through Wren's remarkable geometrical staircase in the South West Tower, the chapel of the great overseas order of St. Michael and St. George was visited. In the crypt, with its special corners for soldiers, sailors, and painters, the burial places of various eminent men were seen.

The three remaining tours are:—Tuesday, September 13, St. Martin's, Ludgate; Remains of London Wall; Stationers' Hall. Wednesday, September 21, St. Andrew-by-the-Wardrobe; Playhouse Yard (site of Shakespeare's Blackfriars Theatre). Tuesday, September 27, Staple Inn; Furnival's Hall; Holborn Houses; St. Sepulchre's, Holborn (Dickens land). Application for tickets should be made to the editor.

Crawshaw's Chemical Colander

A British Invention Taken Over by I.C.I.

ENGINEERS know the difficulty of cleaning greasy parts of machinery such as gear-boxes, axle shafts, silent chains, ball races, etc., and will welcome news concerning a British invention which has been taken over by Imperial Chemical Industries, Ltd. The invention is known as "Crawshaw's Chemical Colander" and consists essentially of a tank, in the bottom of which a special substance known as "Crawshawpol" is placed. The substance, which boils at a very low temperature, is heated by such means as may be available.

In the upper portion of the tank there is a condensing coil, through which cold water circulates. The parts of machinery to be degreased are placed in the tank, which may vary in pattern and size to suit any class of article, small or large. The closing of the lid of the tank and the turning of a water tap completes the first operation. Directly the chemical begins to vaporise, it throws off fumes which are condensed by means of the condensing coil through which water is constantly circulating. The result is a shower bath of "Crawshawpol," which literally eats the grease off the metal parts. In a few minutes, the heating apparatus may be turned off and the tank opened, the result showing that the parts to be degreased are delivered from the apparatus in a dry condition and absolutely free from grease, all that is then necessary being the use of a soft brush or air blow to rid the surfaces of dry dust.

After the solvent has dissolved and washed away the oil and grease from the work, it falls back to the supply at the bottom. Here the grease is locked, and the continuous boiling of the solvent will not vaporise the oil, because it has a considerably higher boiling point than the solvent itself, so that once the oil is down in the bottom it will never get back on the work. This is claimed to be the important feature of Crawshaw's Chemical Colander. All the oil is removed and none gets back, with the result that second and subsequent loads of work are degreased in an atmosphere of perfectly pure solvent, which has no deleterious effect whatever on any kind of metal, whether tempered or not.

We are informed that the labour saving, in suitable instances, by the use of this colander is so remarkable that work that formerly occupied a day may be completed within half an hour. This invention will be exhibited at the Shipping, Engineering and Machinery Exhibition, and probably also at the Public Works, Roads and Transport Congress and Exhibition.

Opening of the Shipping Exhibition

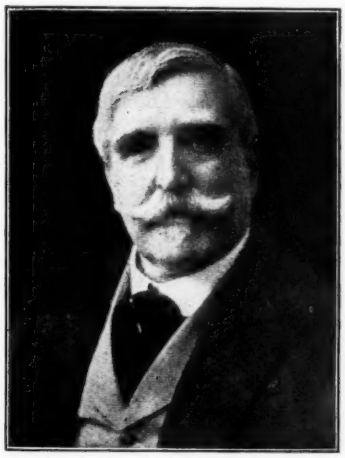
AT the Shipping Engineering and Machinery Exhibition which was opened on Thursday at Olympia, there are a number of exhibits by firms well known in the chemical and metallurgical industries. Thos. Firth and Sons, Ltd., of Sheffield, show a comprehensive display of stainless and Staybrite steels, and the Foster Instrument Co. have a stand devoted to measuring instruments. The Cambridge Instrument exhibits were noted last week. Hecla and E a steels form the chief exhibit of Hadfields, Ltd., while "Melanoid" and other enamels are displayed by the Mond Staffordshire Refining Co. Newton, Chambers and Co., Ltd., show Izal cutting emulsion for cutting tools and liquid oxygen plant is shown by Liquid Air, Ltd., and by the British Oxygen Co. "Permutit" water softeners are exhibited by United Water Softeners, Ltd.

During the course of the exhibition official visits will be paid by the Institution of Chemical Engineers, The British Chemical Plant Manufacturers' Association, The Society of Chemical Industry, The Institute of Metals, The British Cast Iron Association, and the Institution of Fuel Technology. In opening the exhibition the Duke of Northumberland said that in particular he wished to draw attention to the exhibits of non-corrodible materials, such as monel metal, stainless steel, etc. He had been told by his friend Sir Robert Hadfield that the damage done by corrosion amounted to £500,000,000 a year. These exhibits were interesting as exemplifying an effort to combat that loss. Dr. H. D. Hele-Shaw, in proposing a vote of thanks, stated that 45 learned societies had been invited to visit the exhibition, and he understood that 2,000 applications had been received from firms in all parts of the world for the catalogue.

£100,000 for Leeds University

Sir Edward Brotherton's Handsome Gift

THE anonymous donor of £100,000 to Leeds University for the new library has now been revealed as Sir Edward A. Brotherton, chairman of the tar distilling firm, Brotherton and Co., Ltd. Sir Edward is a life member of the Court of the University. As chairman of the advisory committee on Pathology and Bacteriology he took a keen interest in Bacteriology, and in 1922 gave £20,000 to found a Chair of Bacteriology, and to develop bacteriological research.



SIR E. A. BROTHERTON

Sir Edward has held office as Mayor and as Lord Mayor of Leeds and has represented the City, of which he is a Freeman, as a Conservative Member of Parliament. He is also a Doctor of Laws of the University. Among the companies in which Sir Edward is interested are Cassel Cyanide, United Alkali, and British Alizarine.

British Fair's Triumph

Government Tribute to the Press

THE record of the British Industries Fair for the boom year of 1921 is regarded by the Department of Overseas Trade as already broken. According to figures published this week, the space taken for the London section of next February's Fair is now 9,000 square feet more than it was at the White City this year, and, with several months still to run, the combined space booked at London and Birmingham is already only a few thousand feet short of the record.

"The astonishing success of the Fair," said an official of the Department of Overseas Trade in an interview, "is a solid tribute to the cumulative effect of wide newspaper advertising at home and overseas and to the patriotic lead which editors everywhere have given the public. The practical business results of last year's Fair have led at least 80 per cent. of the exhibitors to come in again, and to bring in their wake not only firms who have exhibited in the past and dropped out, but a large number of others quite new to the Fair.

"At this comparatively early date the majority of sections are all bigger than last year. Certain of them, indeed, have now but little space left and the question whether the increased space available for the next three years will be adequate is already exercising the minds of the Department. The graph of buyers is ascending. Last year the Fair was visited by a record number of them.

Catalytic Production of Propyl Alcohol

A REPORT is current that Dr. Alwin Mittasch, of the I.G., has found a method of producing propyl alcohol catalytically, and it is also stated he has developed a new motor fuel, thought to be based on a mixture of his synthetic methanol with gasoline. Dr. Mittasch is leaving for the United States where he will devote some time to scientific study in collaboration with American industry.

Indian Chemical Notes

[From Our Indian Correspondent.]

A factory for manufacturing leather cloth, oilcloth, bookbinding cloth, etc., has been lately attached to the Dharamsi Morarji Woollen Mills at Ambernath, near Bombay. The products of this factory have now been successfully placed on the local market, and have been much appreciated by the public. The factory also manufactures thick artificial leather of various colours and patterns suitable for high-class upholstery for motor seats and motor hoods, which, owing to its excellent quality, finds a good market.

Bombay Match Factories

The number of match factories in Bombay is increasing, and there are at present no less than 15 factories employing about 5,000 workers. All these have been started during the last four years. Much of the wood necessary for match manufacture has now to be imported, but the Bombay Forest Department has taken up the question of surveying and developing home resources in this respect with a view to assisting the new industry.

The Paper Duties

The Government of India has decided to introduce legislation in the next session of the Assembly to amend the Bamboo Paper Pulp Industry (Protection) Act of 1925. The proposed amendment will make printing paper containing no mechanical wood pulp liable to a protective duty of one anna per lb., and will have a retrospective effect from September 21, 1925, the date on which the Act became law.

Punjab Oil Industry

After an extensive tour in the chief centres of the vegetable oil industry in the Punjab, the Agricultural Chemist to the Punjab Government has submitted a scheme for the formation of a company, with a capital of Rs. 50 lakhs, for the establishment of a modern oil mill in the province. The question is now occupying the attention of the Board of Economic Development.

Industrial Alcohol

In the annual report of his administration, the Director of Industries, Bombay, discusses the possibilities of manufacturing industrial alcohol in the province from Mhowra flowers, and recommends to the Government that the industry may be started as a pioneering enterprise, which would have every chance of success. The total imports of industrial alcohol into India every year amount in value to Rs. 3 crores.

Steel in Mysore

The Government of Mysore State is considering a proposal to manufacture steel at its Bhadravati Iron Works. It is proposed to build a Siemens-Martin basic open-hearth furnace and rolling mills capable of producing 25 tons of steel per day, at an outlay of about Rs. 14 lakhs. There is a large demand in the State for bars, squares, and flats, from which the village blacksmith is able to prepare cart tyres and many of the tools and agricultural implements used in villages.

Research in Hyderabad

The Department of Industries, Hyderabad State, carried out research on the following subjects during the past year :—(1) Storage of Mohua flower ; (2) Utilisation of Mohua spent wash as fertiliser ; (3) Recovery and production of thymol from the uncrystallised portion of ajwan oil ; (4) Effect of sewage and sewage gases on cement concrete pipes ; (5) Gentian substitute from Rechiks plant, and various other standard tinctures of B.P. specification from local drugs.

Indian Turpentine Production

According to the annual report of the Indian Turpentine and Rosin Co., Ltd., the working of the company's factory has continued to be satisfactory and the high standard attained by its products has been fully maintained. It is reported that a fair portion of the output which was surplus to Indian requirements was readily absorbed by foreign markets. An export business is said to have been thus established. The prospects for the future appear bright, except for the fact that the world prices of turpentine and rosin have recently been declining, and some competition has been met from the products of wood distillation.

S. G. W.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published ; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

73 (*Isopropyl Alcohol*).—An American firm wishes to get in touch with a company manufacturing isopropyl alcohol from acetone.

Vacant Appointments

A Lectureship in Biochemistry (Grade I) in the Physiological Department, University of Birmingham, £600. The Secretary. September 21.

An Assistant (Grade 1) under the Directorate of Metallurgical Research, Research Department, Woolwich. £370 to £550 per annum. The Chief Superintendent, Research Department, Woolwich, S.E.18.

A Lectureship in Chemistry in the University of West Australia. £450 to £550 per annum and £100 travelling expenses. Office of the Agent-General for Western Australia, 115, Strand, London, W.C.2. October 1.

Research on the Heat Resistance of Cement

Experiments carried out at the Bradford Technical College, for the Building Research Board, to improve the fire-resisting qualities of cement are described in a report issued last week by the Department of Scientific and Industrial Research. Portland cement, it is pointed out, as at present manufactured, contains, after setting, a quantity of free hydrated lime, finely disseminated throughout the cement. In a fire the lime, if the temperature be sufficiently high, is dehydrated and contracts, but when the fired concrete is exposed to water, it is rehydrated and, therefore, expands again. A powerful disintegrating action is thereby set up, which tends to make the building crumble. It is, therefore, necessary to make some addition to the cement which will combine with the free lime that is liberated on setting. Suitable materials would be those used in practice as pozzolanic materials for the manufacture of lime mortars, such as coal clinker and burnt clay products. These materials are able to combine with the lime to form hydrated compounds of lime, silica, and alumina, which, unlike hydrated lime itself, do not recombine rapidly with water to cause an expansion after dehydration due to heat.

The Effect of Cadmium Salts in Nickel-plating

An investigation was recently conducted at the University of Maine, by Professor H. C. White and K. L. Proctor, to determine the brightening effect of cadmium in still nickel plating solutions. Standard plating solutions and the usual commercial current densities were used. The percentage of cadmium chloride in the bath was increased in each succeeding run by 0·01 per cent. The deposit became increasingly brighter as the percentage of cadmium salt was increased, up to 0·05 per cent. From this point to 0·10 per cent. there was apparently no change. Above 0·10 per cent. the deposits gradually became poorer in quality, and with 0·50 per cent. the deposit was bad and black in colour. The proper range, then, to obtain the maximum brightness is between 0·05 and 0·10 per cent. cadmium chloride. With agitated baths, results showed that the values are somewhat different, and the values are now being determined for this type of bath.

A New Mineral Colour Merger in Germany

A new combination of manufacturers of mineral colours is being effected in Germany, and it is reported that Karaus Farben and Oelwerke A. G., Dusseldorf, will fuse with Heyl-Beringer, Berlin, manufacturers of mineral colours, a combination formed in August, 1926. As the intended merger plans to enlist other mineral colour establishments in a larger merger, the consolidation gains significance. It is further stated that Heyl-Beringer will raise its capital from 1,000,000 to 15,000,000 or 18,000,000 marks for fusion purposes. Heyl-Beringer has an agreement with the I. G. on cadmium colours.

From Week to Week

SIR ALFRED MOND has contributed £200 towards the fund for the preservation of ancient cottages.

ALICE SALT, aged 17, an employee of Cascelloid and Co., was burned to death in a fire which occurred at the company's celluloid factory at Leicester on September 1.

SIR JOSIAH STAMP will, in October, succeed Sir Guy Granet as chairman of the L.M. and S. Railway Co., at the same time retaining his post as president of the executive.

THE LAUNDRY, CLEANING, AND DYEING TRADES are the subject of a preliminary report on the Third Census of Production published in the *Board of Trade Journal* for September 8.

TUNISIAN PRODUCTION OF PHOSPHATE in the first four months of this year amounted to 783,000 metric tons, representing an increase of 104,000 tons on the corresponding period in 1926.

THE INTERNATIONAL COMBUSTION ENGINEERING CORPORATION of New York has purchased control of the F. J. Lewis Manufacturing Co., manufacturers of coal tar products, of Granite City, Illinois.

UNIVERSITY NEWS.—*Leeds:* The honorary degree of LL.D. has been conferred on Sir Arthur Keith and Sir Charles Parsons, and Dr. N. V. Sidgwick and Professor J. S. Haldane have been the recipients of the D.Sc. degree.

A SUBSTANTIAL INCREASE IN THE CANADIAN OUTPUT of acids alkalis, salts, and compressed gases was recorded in 1926 when production of these products reached a total value of $30,232,322 or 2·7 million dollars above the corresponding figure for 1925.

MR. FRANCIS H. CARR, president of the Society of Chemical Industry, was unable, owing to the very serious illness of his mother, to take part in the discussion on "The Chemistry of the Hormones," organised by the Chemistry Section of the British Association.

PROFESSOR PAUL WALDEN, the well-known German physica chemist, is visiting the United States. He will spend the winter term at Cornell University, Ithaca, New York, lecturing on chemical history, electrochemistry, and stereochemistry, and will organise some research work.

THE OIL AND CHEMICAL WORKS of Richard Meyer, of Reval, comprising 29 different industrial branches, with 80 factories, have it is reported, been purchased by an industrial syndicate comprising British, French, and Scandinavian industries, with the financial support of a firm of British bankers.

OWING TO THE ABSENCE OF SHAREHOLDERS at the meeting, on August 29, convened in connection with the voluntary winding up of the International Pulp and Chemical Co., Ltd. (a purely formal matter), the chairman, Mr. William Morrison, proposed that the meeting should be adjourned to a date to be fixed.

MISS DOROTHY JORDAN LLOYD, D.Sc., has been appointed by the council of the British Leather Manufacturers' Research Association to succeed Dr. R. H. Pickard as Director of Research. Dr. Lloyd was lately an "N" fellow of Newnham College, Cambridge, and has published several papers on the chemistry of gelatine. She has been a member of the research staff of the British Leather Manufacturers' Research Association, and has done valuable work on tanning.

THE U.S. TREASURY officials, in conjunction with the Customs Bureau, will require at least two months to determine whether there has been any "dumping" of foreign rayon in the American markets. The great rise in American imports of foreign rayon is revealed in recently released figures showing 7,926,916 lb. received in the first six months of 1927, invoiced at 6,453,483 dollars, compared to 4,864,221 lb., valued at 4,741,047 dollars, in the corresponding period of last year.

TWO NEW SYNTHETIC AMMONIA PLANTS are now at work in France. The State synthetic nitrate plant, which was constructed at the former powder works at Toulouse, has commenced production after many unforeseen delays and has an initial output of 50 metric tons of ammonium sulphate daily. The Cie des Mines de Vicoigne, Noeux and Drocourt, has completed the installation of its first Casale unit at Drocourt and is producing seven and a half tons of synthetic ammonia daily.

ARTIFICIAL SILK NEWS.—In order to take acid fumes high into the air and prevent damage being done to breweries in the town, the Branston Artificial Silk Co. will build a chimney 363 ft. high at its factory at Burton-on-Trent, where it is hoped that the manufacture of artificial silk will be commenced early in the new year.—Rayon Manufacturing Co. (1927), Ltd., which has been registered recently, is to take over the business of the Rayon Manufacturing Co., Ltd., in voluntary liquidation.

THE CZECHOSLOVAK PRODUCERS OF NITROGENOUS FERTILISERS have united in the formation of a joint sales organisation, which will be devoted to mutual sales both in Czechoslovakia and in foreign countries. The new organisation was scheduled to begin operations in Prague on July 1, 1927, under the name of "Association for the Sale of Nitrogenous Materials (Ltd.) in Prague." One of the most important members of the new organisation is the factory which is now under construction at Marianske Hory to operate the Claude ammonia synthesis process.

IT IS PROPOSED TO HOLD a British Empire Exhibition at Sydney, Australia, in 1931.

SIR ALFRED AND LADY MOND have returned to London from Aix-les-Bains and Evian-les-Bains, where they have been for the cure.

A MEETING OF THE SOCIETY OF LEATHER TRADES CHEMISTS will be held at the Leathersellers' College, 176, Tower Bridge Road, S.E.1, to-day (Saturday) at 10 a.m.

RECENT WILLS INCLUDE: Mr. Frederick Bentley, of Birkenhead, a director of Goodlass, Wall and Co., Ltd., paint manufacturers, £91,616 (net personalty, £89,557).

PROFESSOR A. E. V. RICHARDSON, director of the Waite Institute of South Australia, has been appointed the Commonwealth delegate to the Agricultural Research conference to be held in London next month.

DR. J. V. DORR, president of the Dorr Co., has established at the South Dakota School of Mines a prize of $100 to be awarded annually to the student in metallurgy who gives promise of high accomplishment in the metallurgical field.

IN EXPLANATION OF ITS FAILURE to pay a dividend on the 1926 working, Rutgers Werke, Berlin, the big German coal tar refining organisation, states that its Lower Silesian plants have been operating at a loss since the end of the British coal strike.

IT IS AUTHORITATIVELY STATED that a Birmingham firm has acquired the large shale tips at Abernant, near Aberdare, for the purpose of manufacturing tar macadam. Plant is to be erected immediately, and work will be found for a considerable number of men.

SALES OF NITRATE OF SODA under the free selling system during the fortnight ended August 15 last amounted to 119,325 metric tons, for delivery up to June, 1928, bringing the total of such sales since the introduction of free selling on April 14 last up to 1,316,119 metric tons.

THE WEDDING WILL TAKE PLACE on September 22 of Mr. Rudolph Muspratt, son of Sir Max Muspratt, to Miss Constance Lloyd Davies, daughter of Mr. Meurig Lloyd Davies, F.C.I.C., formerly manager of the United Alkali Co., and president of the Standard Chemical Co., of Canada.

THE CANADIAN PULP AND PAPER ASSOCIATION has let contracts for the construction of the $250,000 pulp and paper building for McGill University, Montreal, which is expected to be completed by December. The building will house all the laboratories, and the entire Department of Cellulose Chemistry, which is now temporarily in the Biological Building under direction of Dr. Harold Hibbert, professor of cellulose chemistry at McGill.

IN CONNECTION WITH THE AGRICULTURAL RESEARCH CONFERENCE, which will open in London on October 4, a number of research workers will visit Edinburgh on October 19–24 to inspect the animal breeding research department of Edinburgh University and the Board of Agriculture's seed testing station at East Craigs, Corstorphine. Dr. Green, recently appointed director of the proposed new Dairy Research Institute for Scotland, will be one of the Scottish representatives at the Conference.

SUGAR BEET NEWS.—A project is on foot for the establishment of a beet sugar factory in Staffordshire, and it is understood that a company is in process of formation, of which Viscount Lewisham is to be chairman, to carry out the scheme. An option has been secured on a site at Penkridge, where it is intended to build a factory capable of dealing with 100,000 to 120,000 tons of beet per annum. An office will be opened in Stafford shortly and tenders invited for the erection of the factory.

IT WAS ANNOUNCED RECENTLY that the acid plants of Goldschmidt A.G., Essen, at Gernsheim and Mannheim-Rheinau, will be combined with the works of Chemische Fabrik Buckau for a consideration of 2,500,000 marks new Buckau shares. Buckau has increased its capital by 2·5 millions for this purpose. At its general meeting, it was announced that Ammoniak and Sodafabrik Stassfurt is changed to a limited liability company, of which Buckau and Bergwerks-und Huetten A. G. each own 50 per cent. of shares. This change is calculated to reduce operating costs.

THERE ARE SEVERAL NEW FEATURES in the curriculum of Birmingham Central Technical College which will reopen on September 26 for the day classes, and for the full time courses in metallurgy and engineering on October 3. A full time two years' course in metallurgy is arranged to suit the needs of students intending to take up a metallurgical career in works or laboratories. The evening classes at the College provide instruction in chemistry, metallurgy, electrical and mechanical engineering and other subjects and, as in the case of the day classes, there is a department dealing with pharmacy. Paint and varnish technology is another special section.

Obituary

DR. J. A. VON WULFING, of the German chemical and pharmaceutical firm of exporters, A. Wülfing and Co., aged 74.

MR. D. HERBERT THOMAS, aged 66, for many years manager of F. W. Berk and Co., chemical manufacturers, has died from injuries received by being knocked down by a cyclist last week.

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REACTIONS.—Oxidation by means of fluorine. Action of fluorine on water and alkali hydroxide solutions. The labile peroxide from sulphuric acid. Action on phosphoric acid, phosphates, and pyrophosphates, carbonates and borates. F. Fichter and W. Bladergroen. *Helv. Chim. Acta.*, July, Vol. X (4), pp. 549–569 (in German).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

275,277. ALKOXYAMINOQUINOLINES. W. Carpmael, 24, Southampton Buildings, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 4, 1926.

6-alkyloxy-8-aminoquinolines are produced by reducing the corresponding 8-azo-or 8-nitro-compounds, or by alkylating 6-oxy-8-acylamino or 6-oxy-8-arylideneamino-quinolines and splitting off the acyl or arylidene residues. The production of 6-methoxy-or 6-ethoxy-8-aminoquinolines by reducing the nitro compound as described in Specification 267,457 (see THE CHEMICAL AGE, Vol. XVI, p. 401) is disclaimed. Examples of the preparation of the 6-methoxy and 6-ethoxy-derivatives are given. The compounds have antipyretic properties and a strong specific destructive action on blood parasites.

275,283. BENZANTHRONE DYES. The British Alizarine Co., Ltd., W. H. Dawson, and P. Beghin, British Alizarine Works, Trafford Park, Manchester. Application date, March 4, 1926.

These are produced by the action of alkali in concentrated form upon Bz1-halogenbenzanthrones having a free 2-position in presence of an aromatic amino compound. They are of the isoviolanthrone type and their properties vary somewhat according to the conditions under which the reaction is effected. Examples are given of the preparation of isoviolanthrone from monochlor-or monobrom-benzanthrone, caustic potash and aniline, and of a more bluish dyestuff, more soluble in aniline than isoviolanthrone, from monochlorbenzanthrone.

275,284. OXYGENATED ORGANIC COMPOUNDS. J. Y. Johnson, 47, Lincoln's Inn Fields, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 4, 1926.

It is known that methanol and higher alcohols can be obtained by the catalytic hydrogenation of carbon monoxide under high pressure and temperature. It is now found that the higher alcohols, such as isobutyl alcohol, can be advantageously obtained when the amount of carbon dioxide in the reaction gases does not exceed about 3 per cent. The gases are circulated over an appropriate catalyst, the oxygenated organic compounds being continuously condensed and carbon dioxide—a product of the reaction—removed from the reaction gases prior to their return to the reaction chamber. The carbon monoxide may be replaced in part, and the hydrogen wholly, by alcohols such as ethyl alcohol; the hydrogen may also be replaced by hydrocarbons. Examples are given of suitable gas mixtures and catalysts.

275,292. DYES. W. Carpmael, 24, Southampton Buildings, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 9, 1926.

These are of the thioindigoid type and are produced by condensing perinaphthoxypenthiophene or a nuclear substituted derivative thereof with an isatin α-halogenide or α-arylide. If the perinaphthoxypenthiophene contains an amino or acylamino group on the *o*-position to the sulphur atom it may also be condensed with thioisatins or their α-halogenides or α-arylides; the products from these components are notable as being green vat dyestuffs. Particularly useful results are obtained when the second component is a 1-halogen-2 : 3-naphthisatin-α-halogenide or arylide or a 2 : 3-diketodihydro-4 : 5-benzothionaphthene or its halogenide or arylide. A large number of examples are given in addition to instructions for the production of the perinaphthoxypenthiophenes. The dyestuffs dye cotton and wool from the vat in fast green to blue shades.

275,301. INTERMEDIATES AND DYES. W. Carpmael, 24, Southampton Buildings, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 29, 1926.

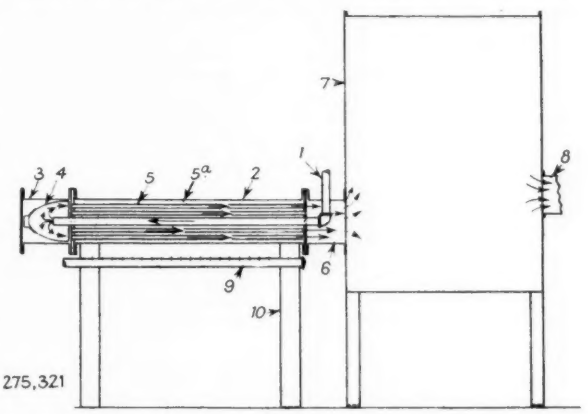
1 : 8-naphthosultams containing a sulpho group in the 3-position to the sultam nitrogen are treated with aromatic amines, preferably with addition of the amine salt and a diluent. The products are 3-arylamino-1 : 8-naphthosultams which can be converted into azine dyes by condensation with aromatic nitroso compounds or by oxidation together with aromatic *p*-diamines or *p*-aminophenols. Examples are given of the condensation of 1 : 8-naphthsultam-3-sulphonic acid and 3 : 6-disulphonic acid with various aromatic amines and the conversion of some of the products into violet wool dyestuffs by condensation with *p*-nitrosodimethylaniline or by oxidation together with 4-amino-dimethylaniline-3-sulphonic acid by means of air in presence of ammoniacal copper oxide.

275,307. DYEING CELLULOSE ACETATE. O. Y. Imray, 30, Southampton Buildings, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 1, 1926.

The dyeing of cellulose acetate silk is effected by means of unsulphonated azo dyestuffs made from naphthylamine carboxylic acids either by diazotising them and coupling with the usual components or by coupling them with diazo compounds. The naphthylamine carboxylic acids may also be applied to the acetate silk, for which they have a strong affinity, and the dyestuffs formed *in situ*. A large number of dyestuffs derived from 2 : 3-and 2 : 6-naphthylamine carboxylic acids and 1-amino-2-ethoxy-naphthalene-6-carboxylic acid are mentioned as suitable, the most varied shades being obtainable by means of them.

275,321. CATALYTIC OXIDATION OF HYDROCARBONS. E. C. R. Marks, 57, Lincoln's Inn Fields, London. From E. I. Du Pont de Nemours and Co., Wilmington, Delaware, U.S.A. Application date, May 3, 1926.

The catalytic oxidation of hydrocarbons, such as the oxidation of naphthalene to phthalic anhydride, is effected by passing the hydrocarbon and an oxygen containing gas through a plurality of relatively small hot catalytic reaction zones



275,321

surrounded by a medium of high heat conductivity, such as a molten metal or a mixture of sodium and potassium nitrates, which serves to maintain the catalyst at a uniform temperature. In the apparatus shown in the figure the mixture of air and naphthalene vapour enters by the pipe 1, is preheated by passage through the conducting material in the casing 2 and oxidation occurs during its passage through the catalyst containing tubes 5. The phthalic anhydride is collected in the condenser 7. A burner 9 serves to heat up the apparatus to the working temperature of 500° C.

275,326. DYEING WITH ICE COLOURS. W. Carpmael, 24, Southampton Buildings, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 4, 1926.

The invention consists in using oxynaphthocarbazoles for the formation of azo dyes on the fibre by the ice colour method. Suitable oxynaphthocarbazoles are 6-and 7-oxy-1 : 2-naph-

thocarbazoles and their brom derivatives, and 7-oxydinaphthocarbazole. Fast bordeaux to black shades can be produced.

275,345. Methanol and other Oxygenated Organic Compounds, Production of. Synthetic Ammonia and Nitrates, Ltd., and H. G. Smith, Billingham, Stockton-on-Tees. Application date, May 12, 1926.

These are produced from carbon monoxide and hydrogen at high pressures by the use of a catalyst consisting of basic zinc chromate substantially of the composition $4ZnO.CrO_3$ or the substances into which this chromate is converted under the reaction conditions. Relatively low temperatures such as 300–400° C. are suitable. This catalyst is suitable for producing methanol, particularly when free from soluble alkali salts and for producing higher alcohols when it contains such salts and the rate of flow of the gases is low.

Note.—Abstracts of the following specifications, which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—253,542 (L. Darrasse, E. Darrasse, and L. Dupont), relating to the manufacture of synthetic camphor, see Vol. XV, p. 209 ; 255,086 (Durand and Huguenin Akt.-Ges.), relating to the manufacture of mordant dyestuffs, see Vol. XV, p. 307 ; 261,406 (Consortium für Elektrochemische Industrie Ges.), relating to the manufacture of polymerised vinyl esters, see Vol. XVI, p. 91 ; 262,126–7 (E. G. T. Gustaffsson), relating to the production of malleable iron and steel directly out of oxide ore, see Vol. XVI, p. 15 (metallurgical section) ; 262,457 (I. G. Farbenindustrie Akt.-Ges.), relating to indigoid dyestuffs, see Vol. XVI, p. 168 ; 266,004 (C. Still), relating to recovery of by-products of coke oven plants, see Vol. XVI, p. 429 ; 267,952 (Durand and Huguenin Soc. Anon.), relating to products for dyeing or printing textile fibres, see Vol. XVI, p. 515 ; 268,722 (Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude), relating to exothermic chemical reactions, see Vol. XVI, p. 558.

International Specifications not yet Accepted

273,718. Oxidising Ammonia. N. Caro and A. Frank, Halensee, Berlin. International Convention date, June 29, 1926.

When producing nitric acid of high concentration by catalytic oxidation of ammonia the latter, together with air, etc., passes through a layer of water or other liquid immediately preceding the catalyst. The liquid serves to absorb the heat of the reaction and may also contain substances for purifying the gas mixture. Thus the gases may pass through a layer of water on a finely perforated tray, a few centimetres above which is disposed a platinum net as catalyst. Other cooling devices may be applied simultaneously.

273,735. Ammonia Synthesis. F. Uhde, Bövinghausen, Westphalia, Germany. International Convention date, July 2, 1926.

This is effected with the aid of a catalyst containing iron, aluminium, carbon, nitrogen, and an alkali metal or alkali metal compound. Such a catalyst may be obtained by adding potassium ferrocyanide to an aluminium chloride or sulphate solution, evaporating to dryness, and reducing with hydrogen at 300–450° C.

273,744. Anhydrous Fatty Acids. Soc. Anon. des Distilleries des Deux-Sèvres, Melle, Deux-Sèvres, France. International Convention date, July 1, 1926.

These are produced from the aqueous acids by extraction with acetic ester or other ester and distillation of the extract whereby first aqueous ester passes over, then the remaining ester, and finally the anhydrous acid. Acetic, proprionic, and butyric acids are mentioned.

273,748. Synthetic Resins. British Thomson-Houston Co., Ltd., Crown House, Aldwych, London. International Convention date, July 1, 1926.

The known synthetic resins in the heat-hardened condition (C stage) are heated with a liquid or liquefiable substance until complete solution occurs. As suitable liquids are mentioned glycol diacetate, diethyl phthalate, acetone, cresol, tricresyl phosphate, triacetin, and others. The resins specified are those of the polyhydric alcohol-polybasic acid type, the phenol-aldehyde type, and the urea-aldehyde type. According to an example a glycerine-phthalic anhydride resin is heated in a closed vessel with one of the above liquids at 170° C. for 36 hours. For urea-aldehyde resins amines such as diphenylamine, toluidine, or pyridine are suitable solvents. The products may be used in the production of varnishes, or as moulding resins or for other purposes.

273,757. Emulsions. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, July 2, 1926.

Aliphatic or hydroaromatic sulphonic acids or their salts are used as emulsifying agents for difficultly soluble organic compounds such as hydrocarbons, insoluble alcohols, ketones, etc. Clear aqueous solutions can be first obtained which yield emulsions on dilution. In an example cyclo-hexanol is treated with a solution of sodium sulpho-oleate.

273,761. Active Carbon. Naamlooze Vennootschap Algemeene Norit Maatschappij, 2, Den Texstraat, Amsterdam. International Convention date, July 3, 1926.

The treatment of carbonaceous materials with activating gases such as superheated steam, carbon dioxide, air, chlorine, sulphur dioxide, etc., is carried out in vertical retorts having an elongated cross section with the major dimension at least twice the minor dimension and of at least 50 cm.

273,765. Phthalamic Acid Esters. A. Fodor, 115, Broadway, New York, U.S.A. International Convention date, July 3, 1926.

These are prepared by treating phthalic anhydride with ammonia, adding an alkali so as to form a phthalamate, and esterifying the latter with an alcohol such as methyl, ethyl, propyl, benzyl, etc., alcohol. When combined with derivatives of *p*-aminobenzoic acid (such as *p*-aminobenzoyl-diethylaminoethanol) they form compounds possessing anæsthetic properties.

273,774. Anthraquinonyl-α-ketones. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, July 5, 1926.

There are obtained by oxidising benzanthrones having in the Bz1 or the Bz2 position an alkyl, carboxyl, or nitrile group. The production of 1-acetylanthraquinone from Bz1-methyl- or Bz1 : Bz2-dimethylbenzanthrone, anthraquinonylmethyldiketone from Bz2-methylbenzanthrone, and two ketones from benzanthrone-Bz1-nitrile, is described.

274,023. Ammonia Synthesis. Soc. D'Etudes Minières et Industrielles, 1 bis, Rue de Havre, Paris. International Convention date, July 6, 1926. Addition to 253,540.

When in the catalyst described in the parent specification (See The Chemical Age, Vol. XV, p. 209), the alumina, magnesia, or lime is replaced by a halide, oxyhalide, oxide, ferrocyanide, or ferricyanide of an alkali or alkaline earth metal, the reaction temperature can be reduced to 250–450° C.

274,058. Synthetic Drugs. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, July 8, 1926. Addition to 267,169.

The process of the parent specification, according to which amino compounds of certain classes of compounds are converted into more basic aminoalkylamino compounds, is extended to the conversion of aromatic amino-oxy compounds and aromatic polyamines generally into the more basic derivatives. A very large number of examples are given, the products being of therapeutic value owing to their destructive action on blood parasites.

Latest Notifications.

276,617. Process for the extraction of butyric acid and its homologues. Soc. des Brevets Etrangers Lefranc et Cie. August 27, 1926.

276,659. Manufacture of sulphuric acid. Petersen, H. August 28, 1926.

276,668. Process for purifying hydrogen. Gewerkschaft der Steinkohlenzeche Mont-Cenis. August 26, 1926.

276,677. Manufacture of complex gold-nucleic-acid-compounds. Soc. of Chemical Industry in Basle. August 25, 1926.

276,679. Manufacture of viscose silk. I. G. Farbenindustrie Akt.-Ges. August 25, 1926.

276,687. Process for purifying hydrogen and gases containing hydrogen. Gewerkschaft der Steinkohlenzeche Mont-Cenis. August 30, 1926.

276,692. Process for the manufacture of monobenzoyldiamino anthraquinones. I. G. Farbenindustrie Akt.-Ges. August 30, 1926.

276,697. Manufacture of acid-proof material and objects thereof. I. G. Farbenindustrie Akt.-Ges. August 30, 1926.

Specifications Accepted with Date of Application

255,839 and 255,861. Organic arseno compounds, Process for the production of. A. Binz and C. Rath. July 22, 1925.

267,925. Aldehydes, Manufacture and production of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) March 14, 1927. (International Convention date not granted.)

268,323. Cracking of oils, Process and apparatus for. S. Seelig. March 25, 1926.

275,536. Crude oils and fats, process of treating. Metallbank und Metallurgische Ges. Akt.-Ges. August 9, 1926.

276,048. Manganese steel. Sir R. A. Hadfield. May 11, 1926.

276,066. Manufacture of cements, calcination of ores, and kilns therefor. G. Martin. May 17, 1926.

276,100. Dyeing of effect threads. G. B. Ellis. (*Chemical Works formerly Sandoz.*) June 7, 1926.

276,112. Metal phosphides and mixtures containing them, process for forming. W. Koehler. June 25, 1926.

276,120. Chromium compounds, Production of. L. Mellersh-Jackson. (*Mathieson Alkali Works.*) July 20, 1926.

276,126. Products of conversion of peri-cyannaphthalene sulphonic acids. W. Carpmael. (*I. G. Farbenindustrie Akt.-Ges.*) July 28, 1926.

276,155. Molybdates, process of producing. A. Kissock. September 4, 1926.

276,156. Quinoline derivatives, Manufacture of. British Dyestuffs Corporation, Ltd., and M. Wyler. September 6, 1926.

276,190. Sound silicon iron, Method of making. V. B. Browne. October 25, 1926.

276,200. Recovery of copper, zinc, and other metals from solutions containing chlorides and sulphates. J. Y. Johnson. (*Duisburger Kupferhütte.*) November 18, 1926.

Applications for Patents

Carpmael, A. (I. G. Farbenindustrie Akt.-Ges.). Manufacture of ceramic products. 22,705. August 29.

Carpmael, A. (I. G. Farbenindustrie Akt.-Ges.). Manufacture of ethers of 6.8-dioxyquinoline. 23,037. September 1.

Carpmael, A. (I. G. Farbenindustrie Akt.-Ges.). Manufacture of 8-hydroxyquinoline, etc. 23,117. September 2.

Chemical Works, formerly Sandoz, and Ellis, R. E. Separation of the cardio-active glucoside of bulbous scillæ into two components. 23,005. September 1.

Coles, S. O. Cowper-. Sherardising. 23,057. September 2.

Gibson, W., Imperial Chemical Industries, Ltd., Hailwood, A. J., Shepherdson, A., and Payman, J. B. Naphthalene derivatives. 22,663. August 29.

Gubelmann, I., Stallman, O., and Weiland, H. J. Process of making 1, 3-diamino-2-hydroxyanthraquinone. 22,688. August 29.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of hydrocarbons of low boiling point. 22,684. August 29.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Conversion of alkali chlorides into nitrates. 22,685. August 29.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of black tetrakisazo dyestuff. 22,686. August 29.

I. G. Farbenindustrie Akt.-Ges. Manufacture of ceramic products. 22,705. August 29.

I. G. Farbenindustrie Akt.-Ges. Process for obtaining cellulose from ligno-cellulosic material. 22,749. August 30.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of black trisazo dyestuff. 23,016. September 1.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of gases rich in olefines. 23,107. September 1.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Recovery of soluble products from coal, etc. 23,018. September 1.

I. G. Farbenindustrie Akt.-Ges. Manufacture of 6 : 8-dioxyquinoline. 23,037. September 1.

I. G. Farbenindustrie Akt.-Ges. Manufacture of 8-hydroxyquinoline, etc. 23,117. September 2.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of hydrocarbons of low boiling point. 23,191. September 3.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Dyestuffs. 23,192. September 3.

I. G. Farbenindustrie Akt.-Ges. Manufacture of sulphonated cellulose derivatives. 22,656. August 29. (Germany, September 10, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of acid-proof materials. 22,750. August 30. (Germany, August 30, 1926.)

I. G. Farbenindustrie Akt.-Ges. Production of strips from cellulose derivatives. 23,098. September 2. (Germany, April 13.)

Imperial Chemical Industries, Ltd., and Payman, J. B. Vulcanisation accelerators for rubber. 22,872. August 31.

Imperial Chemical Industries, Ltd., and Piggott, H. A. Manufacture of compounds of the morpholine series. 23,006. September 1.

Imperial Chemical Industries, Ltd. Arc welding tools. 23,013. September 1.

Imperial Chemical Industries, Ltd. Treatment of cellulose derivatives. 23,198. September 3.

Imray, O. Y., and I. G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs. 22,657. August 29.

Imray, O. Y., and I. G. Farbenindustrie Akt.-Ges. Process for obtaining cellulose from ligno-cellulosic material. 22,749. August 30.

Newport Co. Para'-amino-ortho-benzoyl-benzoic acid. 22,689. August 29. (United States, December 8, 1926.)

Stubner, E. C. de. Manufacture of pigments, etc. 22,766. August 30. (United States, September 23, 1926.)

Stubner, E. C. de. Manufacture of pigments, etc. 22,767. August 30.

Non-Ferrous Metals in Modern Transport

Dr. Aitchison's Lecture

Dr. L. Aitchison, of Birmingham, gave the opening lecture of the annual meeting of the Institute of Metals at Derby on Tuesday, under the chairmanship of Sir John Dewrance, K.B.E., president of the Institute.

Dr. Aitchison said that the reasons for the employment of the non-ferrous metals in our various systems of transport were very similar to those governing their utilisation in all other branches of engineering. The non-ferrous metals and alloys were only needed when they could offer certain chemicals or physical properties that were required by the engineer, and that were not possessed by iron and steel. In general, these properties were (1) a high resistance to corrosion ; (2) high values of thermal or electrical conductivity ; (3) a low value of specific gravity. In addition, the properties of ease of machining and of cold working and simplicity of casting, contributed to the wider usefulness of the materials. The use of non-ferrous metals, on account of high electrical or high thermal conductivity, was well illustrated by the purposes to which copper was put. This metal entered extensively into the construction of electrical plant, whilst its thermal conductivity was made use of in boiler tubes and the like. A high resistance to corrosion was a conspicuous feature of nickel and its alloys. These metals were not extensively used in connection with transport, but a fairly prominent example of this service is found in cupro-nickel condenser tubes.

Nickel and its alloys, and gun-metal and phosphor bronze castings, were extensively employed in ship construction. The use of metals having a much lower specific gravity than iron and steel, and having, at the same time, mechanical properties which were comparable with those of the ferrous metals, was of great importance in transport systems. The alloys that were actually employed were those based upon aluminium and magnesium. The alloys of aluminium were at present more extensively employed, and found their way into a great many parts. A variety of aluminium casting alloys were employed, and were more or less interchangeable, but the majority of the wrought parts are made in duralumin. In all branches of transport by air, lightness was a greatly prized property.

Another field into which non-ferrous metals entered very largely was that of anti-friction materials. These were of various kinds, having tin, or lead, or copper as their basis. They were able to function in a way that no steel or iron was able to rival.

Stainless Steel Manufacture in Tasmania

Hopes are entertained in Tasmania that it may be possible to establish in the Launceston district an industry for the manufacture of stainless steel.

It is proposed to use the iron ores of the West Tamar. The iron ore bodies of the Beaconsfield district contain chrome, and out of steel made from it many years ago Mr. Grayson, a Sheffield cutler, produced a quantity of steel possessing remarkable qualities. It is on record that the tensile strength of the plates was far in excess of similar plates made from the best manufactured steel procurable from Europe and America.

Chromic acid was the main factor in giving these qualities, but when the ore was dealt with on ordinary blast furnace lines it was credited with being a serious fault. Analyses showed that the ore contained fair quantities of chrome, in the pig the proportion varying from 2 to 10 per cent. Operations were stopped in 1877, and since then the deposits have not been worked.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton for home market, 1-cwt. drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—8d. to 9d. per lb. Crude 60's, 2s. 5d. to 2s. 7d. per gall.

ACID CRESYLIC 99/100.—2s. 9d. to 2s. 10d. per gall. 97/99.—2s. 4d. to 2s. 6d. per gall. Pale, 95%, 2s. 2d. to 2s. 3d. per gall. Dark, 90%, 1s. 9d. to 1s. 10d. per gall.; 95%, 2s. to 2s. 2d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Crude 65's, 9¼d. to 9¾d. per gall., ex works in tank wagons. Standard Motor, 1s. 1¼d. to 1s. 2¼d. per gall., ex works in tank wagons. Pure, 1s. 5d. to 1s. 6d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 4d. to 1s. 5d. per gall. Firm. Pure, 1s. 6d. to 1s. 7d. per gall.

XYLOL.—1s. 3d. to 1s. 4d. per gall. Pure, 2s. 5d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 8d. per gall. Heavy, 9d. per gall. Standard specification, 7½d. to 7¾d. ex works. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 9d. to 10d. per gall. Solvent 90/160, 8½d. to 9¼d. per gall. Solvent 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 8½d. to 9¼d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed or hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £12 per ton. Quiet. Flaked, £12 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 90s. to 92s. 6d. per ton, f.o.b., according to district. Market firm.

PYRIDINE.—90/140, 5s. 9d. to 6s. per gall. 90/180, 4s. 6d. to 5s. per gall. Heavy, 4s. to 4s. 6d. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7½d. per lb. naked at works.

ANILINE SALTS.—7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 7½d. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8¾d. per lb. Only limited inquiry.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—9d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 2d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

N. W. Acid.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 to £9 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5½d. to 6½d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 3½d. to 2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.

Acid, Boric B.P.—Crystal, 40s. to 43s. per cwt.; powder, 44s. to 47s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—1s. 7d. to 1s. 8d per lb., less 5%.
Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.
Acid, Pyrogallic, Crystals.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
Acid, Salicylic, B.P.—1s. 3d. to 1s. 4d. per lb.; Technical.—11½d. to 1s. per lb. Good demand.
Acid, Tannic B.P.—2s. 8d. to 2s. 10d. per lb.
Acid, Tartaric.—1s. 3½d. per lb., less 5%. Firm market.
Amidol.—9s. per lb., d/d.
Acetanilide.—1s. 6d. to 1s. 8d. per lb. for quantities.
Amidopyrin.—8s 6d. per lb.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: 1s. per lb.
Atropine Sulphate.—11s. per oz. for English make.
Barbitone.—6s. per lb.
Benzonaphthol.—3s. 3d. per lb. spot.
Bismuth Carbonate.—9s. 9d. to 10s. per lb.
Bismuth Citrate.—9s. 6d. to 9s. 9d. per lb.
Bismuth Salicylate.—8s. 9d. to 9s. per lb.
Bismuth Subnitrate.—7s. 9d. to 8s. per lb.
Bismuth Nitrate.—5s. 9d. to 6s. per lb.
Bismuth Oxide.—13s. 9d. to 14s. per lb.
Bismuth Subchloride.—11s. 9d. to 12s. per lb.
Bismuth Subgallate.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts. 11½d. per lb.
Borax B.P.—Crystal, 24s. to 27s. per cwt.; powder, 26s. to 29s. per cwt. according to quantity. Carriage paid any station in Great Britain, in ton lots.
Bromides.—Potassium, 1s. 9½d. to 1s. 10½d. per lb.; sodium, 2s. to 2s. 1d. per lb.; ammonium, 2s. 2d. to 2s. 3d. per lb.; granulated ½d. per lb. less; all spot.
Calcium Lactate.—1s. 2½d. to 1s. 3½d. per lb.
Camphor.—Refined flowers, 2s. 11d. to 3s. 1d. per lb., according to quantity; also special contract prices.
Chloral Hydrate.—3s. 6d. per lb., duty paid.
Chloroform.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
Creosote Carbonate.—6s. per lb.
Ethers.—Prices for Winchester quarts; dozen Winchester quarts; carboys or drums; and 10 cwt. lots respectively: '730—1s. 2½d.; 1s. 2d.; 1s. 1½d.; 1s. 0½d.; '720 technical—1s. 5½d.; 1s. 5d.; 1s. 4½d.; 1s. 3½d.; '720 pur. (Aether B.P., 1914)—2s. 4d.; 2s. 3½d.; 2s. 3d.; 2s. 2d.
Formaldehyde.—£39 per ton, in barrels ex wharf.
Guaiacol Carbonate.—5s. per lb.
Hexamine.—2s. 4d. to 2s. 6d. per lb.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. 3d. per gal. In carboys. Winchesters, 2s. 11d. to 3s. 9d. per gal.; 20 vols., 4s. 3d. per gal.; Winchesters, 5s. to 6s. 6d. per gal. Special prices for larger quantities.
Hydroquinone.—2s. 11d. per lb., in cwt. lots.
Hypophosphites.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
Iron Ammonium Citrate.—B.P., 2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
Iron Perchloride.—4d. per lb., 22s. per cwt.
Magnesium Carbonate.—Light commercial, £31 per ton net.
Magnesium Oxide.—Light commercial, £62 10s. per ton, less 2½%; Heavy Commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
Menthol.—A.B.R. recrystallised B.P., 18s. 6d. per lb. net; Synthetic detached crystals, 9s. to 10s. per lb., according to quantity; Liquid (95%), 11s. 3d. per lb.
Mercurials B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 5d. to 7s. 7d. per lb., levig., 6s. 11d. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 8d. to 5s. 10d. per lb., Powder, 5s. 1d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 10d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 3d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 9d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. to 6s. 2d. per lb.; Sulph. nig., 5s. 9d. to 5s. 11d. per lb. Special prices for larger quantities.
Methyl Salicylate.—1s. 9d. per lb.
Methyl Sulphonal.—9s. 6d. to 9s. 9d. per lb.
Metol.—11s. per lb. British make.
Paraformaldehyde.—1s. 9d. per lb. for 100% powder.
Paraldehyde.—1s. 4d. per lb.
Phenacetin.—2s. 9d. to 3s. per lb.
Phenazone.—4s. 3d. to 4s. 6d. per lb.
Phenolphthalein.—6s. to 6s. 3d. per lb.
Potassium Bitartrate 99/100% (Cream of Tartar).—98s. per cwt. less 2½%.
Potassium Citrate.—B.P.C., 1911: 1s. 8d. to 1s. 11d. per lb.; U.S.P.: 1s. 11d. to 2s. 2d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb., in cwt. lots.
Potassium Iodide.—16s. 8d. to 17s. 2d. per lb. according to quantity.
Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 6d. per lb., spot.
Quinine Sulphate.—2s. per oz., 1s. 8d. to 1s. 9d. for 1000 oz. lots in 100 oz. tins.
Resorcin.—3s. 9d. to 4s. per lb., spot.
Saccharin.—55s. per lb.; in quantity lower.
Salol.—2s. 4d. per lb.
Sodium Benzoate, B.P.—1s. 10d. to 2s. 2d. per lb.
Sodium Citrate, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—2s. to 2s. 1d. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
Sodium Ferrocyanide.—4d. per lb., carriage paid.
Sodium Hyposulphite, Photographic.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
Sodium Salicylate.—Powder, 1s. 8½d. to 1s. 9½d. per lb. Crystal, 1s. 9½d. to 1s. 10½d. per lb.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 2d. per lb.
Sodium Sulphite, anhydrous, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
Sulphonal.—6s. 6d. to 6s. 9d. per lb.
Tartar Emetic, B.P.—Crystal or powder, 2s. 1d. to 2s. 2d. per lb.
Thymol.—Puriss., 10s. to 10s. 3d. per lb., according to quantity. Firmer. Natural, 15s. per lb.

Perfumery Chemicals

Acetophenone.—6s. 6d. per lb.
Aubepine (ex Anethol), 10s. 6d. per lb
Amyl Acetate.—2s. per lb.
Amyl Butyrate.—5s. 3d. per lb.
Amyl Salicylate.—3s. per lb.
Anethol (M.P. 21/22° C.).—5s. 6d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—2s.
Benzyl Alcohol free from Chlorine.—2s. per lb. per lb.
Benzaldehyde free from Chlorine.—2s. 6d. per lb.
Benzyl Benzoate.—2s. 6d. per lb.
Cinnamic Aldehyde Natural.—17s. per lb.
Coumarin.—10s. per lb.
Citronellol.—13s. 9d. per lb.
Citral.—8s. 3d. per lb.
Ethyl Cinnamate.—6s. 6d. per lb.
Ethyl Phthalate.—2s. 9d. per lb.
Eugenol.—8s. 6d. per lb.
Geraniol (Palmarosa).—18s. 6d. per lb.
Geraniol.—6s. 6d. to 10s. per lb.
Heliotropine.—4s. 9d. per lb.
Iso Eugenol.—13s. 6d. per lb.
Linalol.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
Linalyl Acetate.—Ex Bois de Rose, 18s. 6d. per lb. Ex Shui Oil, 14s. 6d. per lb.
Methyl Anthranilate.—8s. 6d. per lb.
Methyl Benzoate.—4s. per lb.
Musk Ketone.—35s. per lb.
Musk Xylol.—8s. per lb.
Nerolin.—4s. 6d. per lb.
Phenyl Ethyl Acetate.—12s. per lb.
Phenyl Ethyl Alcohol.—10s. 6d. per lb.
Rhodinol.—32s. 6d. per lb.
Safrol.—1s. 6d. per lb.
Terpineol.—1s. 8d. per lb.
Vanillin.—17s. to 17s. 6d. per lb.

Essential Oils

Almond Oil.—11s. per lb.
Anise Oil.—3s. per lb.
Bergamot Oil.—28s. per lb.
Bourbon Geranium Oil.—14s. 6d. per lb.
Camphor Oil.—75s. per cwt.
Cananga Oil, Java.—26s. per lb.
Cinnamon Oil Leaf.—6d. per oz.
Cassia Oil, 80/85%.—7s. 6d. per lb.
Citronella Oil.—Java, 85/90%, 1s. 11d. per lb. Ceylon, pure, 1s. 9d. per lb.
Clove Oil.—6s. per lb.
Eucalyptus Oil, 75/80 %.—2s. 3d. per lb.
Lavender Oil.—Mont Blanc, 38/40%, Esters, 20s. per lb.
Lemon Oil.—8s. per lb.
Lemongrass Oil.—4s. 6d. per lb
Orange Oil, Sweet.—11s. 3d. per lb.
Otto of Rose Oil.—Anatolian, 30s. per oz. Bulgarian, 75s. per oz.
Palma Rosa Oil.—10s. 6d. per lb.
Peppermint Oil.—Wayne County, 17s. 6d. per lb.; Japanese, 8s. 3d. per lb.
Petitgrain Oil.—7s. 9d. per lb.
Sandalwood Oil.—Mysore, 26s. 6d. per lb.; 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, September 8, 1927.

THE volume of business continues steady. Most prices remain unchanged. Export inquiry is maintained.

General Chemicals

ACETONE is still in fair demand; price unchanged at £62 per ton, with reductions for quantity.

ACID ACETIC is steady at £37 to £38 per ton for 80% grades.

ACID FORMIC continues in fair demand; price unchanged at £47 per ton for 85%.

ACID LACTIC.—Unchanged.

ACID OXALIC.—There is a little more demand; price still very firm at about £30 per ton.

ALUMINA SULPHATE.—Unchanged at about £5 10s. for 17-18%.

ARSENIC.—Unchanged.

BARIUM CHLORIDE is in rather better demand; price £8 to £8 10s., ex warehouse.

COPPER SULPHATE.—Unchanged.

EPSOM SALTS.—Still in good demand; price unchanged.

FORMALDEHYDE is in fair demand and stocks are still short; price firm at £41 per ton.

LEAD ACETATE is still in fair demand for spot delivery; white is £43 to £44 per ton, and brown £42 to £43.

LEAD NITRITE.—Unchanged.

LIME ACETATE.—Unchanged.

METHYL ALCOHOL.—The position remains firm at £55 to £62 per ton, according to grade.

POTASSIUM CHLORATE.—Demand is still quiet; price firm at £25 per ton.

POTASSIUM PERMANGANATE.—The advance is still maintained and the price varies from 8¼d. to 8½d. per lb.

POTASSIUM PRUSSIATE.—There is a little more demand; price unchanged.

SODA ACETATE is still in good demand; price firm at £19 per ton.

SODA BICHROMATE.—Unchanged.

SODA CHLORATE.—Demand remains fair, and the price is firm at £25 to £26 per ton.

SODA HYPOSULPHITE.—Unchanged.

SODA NITRITE.—In good demand; price £19 10s. to £20 per ton.

SODA PHOSPHATE.—Unchanged.

SODA PRUSSIATE.—Steady at 4⅜d. per lb.

SODA SULPHIDE.—Unchanged.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

The coal tar product market is rather quiet, with little change in values to report from last week.

90's BENZOL is unchanged, and is quoted at 1s. 4d. to 1s. 5d. per gallon on rails, while the motor quality is quoted at 1s. 1½d. to 1s. 2½d. per gallon.

PURE BENZOL is quoted at 1s. 7½d. to 1s. 8½d. per gallon on rails.

CREOSOTE OIL remains firm, the price in the North being 7½d. per gallon on rails, while the price in London is about 8½d. per gallon.

CRESYLIC ACID is worth about 2s. 2d. per gallon, ex works, for the pale quality, 97/99%, while the dark quality, 95/97%, is quoted at about 1s. 11d. per gallon.

SOLVENT NAPHTHA is plentiful and can be bought at about 10d. per gallon, on rails.

HEAVY NAPHTHA is unchanged at about 11d. per gallon on rails.

NAPHTHALENES.—Prices remain steady at about £6 15s. to £7 per ton for the 74/76 quality, and at about £8 to £8 15s. per ton for the 76/78 quality.

PITCH.—The demand is active and prices still have an upward tendency. To-day's value is 90s. to 95s., f.o.b. U.K. ports.

Latest Oil Prices

LONDON, September 7.—LINSEED OIL was steady and 2s. 6d. to 3s. advance. Spot, ex mill, £31 10s.; September, £30 10s.; September-December, £30 17s. 6d.; January-April, £31 17s. 6d. RAPE OIL was firm. Crude, extracted, £42; technical, refined, £44, naked, ex wharf. COTTON OIL was steady. Refined, common, edible, £41 10s.; Egyptian, crude, £35 10s.; deodorised, £43 10s. TURPENTINE was inactive. American, spot, 40s.; October-December, £41 per cwt.

HULL, September 7.—LINSEED OIL, spot and September, £31 10s.; October-December, £31 15s.; January-April, £32. COTTON OIL.—Bombay, crude, £34 10s.; Egyptian, crude, £35 5s.; edible refined, £39; technical, £38; deodorised, £41. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £38 5s. GROUNDNUT OIL.—Crushed/extracted, £42; deodorised, £46. SOYA OIL.—Extracted and crushed, £34; deodorised, £37 10s. RAPE OIL.—Crude/extracted, £42 10s.; refined, £44 10s. per ton, net cash terms, ex mill.

Nitrogen Products

Export.—During the past week interest has been maintained for sulphate of ammonia, and the price remains firm at £9 5s. 6d.-£9 8s. per ton, f.o.b. U.K. port in single bags. It is reported from the chief ports that large quantities of sulphate of ammonia have been shipped recently.

Home.—The home market remains featureless. It is understood that some merchants are covering their forward requirements.

Nitrate of Soda.—Very few sales of nitrate of soda have been reported, but the price remains at 16s. 3d. to 16s. 6d. per metric quintal, f.a.s. Chile. In the United Kingdom the prices have been reduced, and the commodity has been recently quoted at £10 7s. 6d. per ton, f.o.r. U.K. port. Although there is some talk of agricultural depression, it is expected that the year 1927-8 will show a considerable increase in the use of fertilisers.

South Wales By-Products

BUSINESS in the South Wales by-product market remains quiet. Pitch is uncertain, and buyers and sellers seem inclined to hold off. Creosote oil is firm and inclined to be scarce, but solvent naphtha continues weak, with practically no demand. The return of fine, dry weather has resulted in an increase in the demand for road tar, but there is no sign of an improvement in coke. Low prices rule for coke, and consequently the ovens are not kept active.

Hamburg Chemical Market

August 26, 1927.

THERE is no improvement in the state of the chemical market. The turnover is very limited. French and Belgian competition has been making itself felt on the world market recently. It would be thought that the German exporter would now receive more support from the German factories, but the latter are still disposed to exclude the exporter where possible. This policy has already resulted in many orders going to France and Belgium, these countries being pleased to make use of the experience of the German exporters.

POTASH CAUSTIC.—There has been a lively inquiry. The works are well employed at the moment, and some are asking for larger delivery terms.

EPSOM SALTS.—The turnover has been satisfactory, and 50-ton lots in jute sacks have been dealt in at £2 f.o.b. Hamburg.

BICARBONATE OF SODA is almost sold out for September delivery. Spot goods are plentiful.

Safeguarding of Industries: Referee and Panel

UNDER the provisions of the Safeguarding of Industries Act, 1921, and of the Finance Act, 1926, complaints as to the improper inclusion of articles in, or their exclusion from, the lists of articles chargeable with duty under Part I of the Safeguarding of Industries Act, as amended by the Finance Act, 1926, have to be referred for decision to a tribunal consisting of the referee appointed by the Lord Chancellor and of two persons selected by the Lord Chancellor from a panel of persons of special scientific attainments appointed by the President of the Board of Trade. Mr. A. A. Hudson, K.C., has been appointed Referee, and the panel has been appointed as follows:—Mr. A. Chaston Chapman, Professor F. G. Donnan, Dr. J. H. Jeans, Professor F. A. Lindemann, Professor S. Smiles, and Professor J. F. Thorpe.

Alcohol for Motor Cars in Hungary

IN order to aid the Hungarian alcohol industry in home markets, the Hungarian Minister of Finance has submitted to Parliament a bill for the obligatory admixture of alcohol to mineral oil products used for motor fuel and to fix the price of alcohol to be used for this purpose.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, September 7, 1927.

THE heavy chemical market has been moderately active during the past week, but quantities asked for are to the small side. Prices remain on about the same level as last reported.

Industrial Chemicals

ACID ACETIC.—98/100%, £65 to £67 per ton according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton. Powder £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In good demand and price unchanged at 8d. per lb., f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Now on offer at 1s. 6d. to 1s. 6¼d. per lb., less 5%, ex store. Continental still high at about 1s. 7d. per lb., less 5%, ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80%.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC.—Quoted 3d. per lb., ex wharf, prompt shipment from the Continent. Spot material on offer at 3¼d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In little demand and quoted price now 1s. 3d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality quoted £8 5s. per ton, c.i.f. U.K. ports; crystal meal, 10s. per ton less. Lump quality on spot offered at £9 per ton, ex store.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA, LIQUID, 880°.—Unchanged at about 2¼d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture unchanged at £23 to £24 per ton, ex station. Continental on offer at about £19 10s. per ton, c.i.f. U.K. ports. Fine white crystals of continental manufacture now quoted £17 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Still scarce for prompt delivery and price again advanced to about £19 17s. 6d. per ton, ex wharf. Spot material on offer at £20 10s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—Continental material unchanged at about £7 10s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4-ton lots. Spot material 10s. per ton extra. Continental on offer at £7 5s. per ton, ex wharf.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturer's price unchanged at £5 to £5 5s. per ton, ex store, with a slight reduction for contracts. Continental quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Continental material quoted £23 per ton, c.i.f. U.K. ports. British material on offer at £23 5s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Unchanged at £38 per ton, c.i.f. U.K. ports. Spot material quoted £39 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material quoted £30 per ton, ex store.

LEAD, WHITE.—Quoted £31 per ton, ex store.

LEAD ACETATE.—White crystals now on offer from the Continent at £40 per ton, c.i.f. U.K. ports; brown, about £38 15s. per ton, c.i.f. U.K. ports. Spot material on offer at £43 5s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

POTASH CAUSTIC, 88/92%.—Solid quality quoted £28 15s. per ton, c.i.f. U.K. ports, minumum 15-ton lots. Under 15-ton lots, £29 10s. per ton. Liquid, £15 per ton, minimum 15-ton lots. Under 15-ton lots, £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4¼d. per lb., delivered.

POTASSIUM CARBONATE, 96/98%.—Unchanged at £27 5s. per ton, ex wharf, prompt shipment. Spot material quoted £28 10s. per ton, ex store; 80/85%, calcined quality on offer at £20 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—Powdered quality quoted £22 10s. per ton, c.i.f. U.K. ports. Crystal, 30s. per ton, extra.

POTASSIUM NITRATE.—Unchanged at £20 7s. 6d. per ton, c.i.f. U.K. ports. Spot material quoted £21 5s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6¼d. per lb., ex store, spot delivery.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6¼d. per lb., ex store, spot delivery. Offered from the Continent at 6⅜d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station. Minimum 4-ton lots on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—English material now quoted £21 per ton, ex store. Continental on offer at £17 5s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¼d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex store. Minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals of British manufacture quoted £15 5s. per ton, ex station, 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at about 4¼d. per lb., ex store. Offered for prompt shipment from the Continent at 4⅛d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—Prices for English material as follows: 60/62%, solid, now £10 10s. per ton; broken, £11 10s. per ton; flake, £13 5s. per ton; crystals, 31/34%, £7 10s. per ton to £8 5s. per ton, according to quality delivered your works, minimum 4-ton lots on contract. Prices for spot delivery 5s. per ton higher for solid, 2s. 6d. per ton for crystals. Offered from the Continent at about £9 5s. per ton, c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 per ton; rock, £11 per ton; floristella, £10 per ton; ground American, £9 5s. per ton; ex store, prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material now quoted £11 5s. per ton ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Intermediates

B. NAPHTHYLAMINE.—3s. 4d. per lb. Some inquiries.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. per 100%. Some inquiries.

N.W. ACID.—4s. 9d. per lb. Some inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some inquiries.

DIMETHYLANILINE.—1s. 9d. per lb. Some inquiries.

BENZALDEHYDE.—2s. 5d. per lb. Some inquiries.

Benn Brothers' Tennis Tournament

ON Saturday, September 3, the annual Tennis Tournament of Benn Brothers, Ltd., was held in Regent's Park, London. There was a good muster of competitors, including Mr. H. B. Crole-Rees, and in spite of dull grey skies an enjoyable day was spent. The winners of the Challenge Cup presented by the firm were :—Gentlemen's Singles, Mr. G. Gilman (Counting House); Ladies' Singles, Miss E. Smith (THE CHEMICAL AGE). The winners of the Handicap Doubles were Mr. P. E. Scoltock (Studio, Ernest Benn, Ltd) and Mr. A. Walsby (*The Timber Trades Journal*). The balls used were supplied by the courtesy of F. H. Ayres, Ltd.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, September 8, 1927.

There is a fair business being done in several of the "bread-and-butter" products of the chemical trade, and values of these and also of most of the other varieties of chemicals remain steady. There is, however, a certain amount of weakness among holders of other lines that are moving sluggishly into consumption, and this is being reflected in current quotations. Both for home use and for export the more general tendency of buyers is to purchase primarily for prompt delivery to meet their early requirements.

Heavy Chemicals

In the case of bicarbonate of soda there has been little change in the position; prices that are being quoted here remain very steady at £10 10s. per ton or thereabouts, and a moderate business is being put through. Nitrite of soda has been selling this week in relatively limited quantities; current offers of this material are at round £19 per ton. Caustic soda continues to move off fairly freely, and prices remain firm at from £14 10s. to £16 10s. per ton, according to quality. In spite of a slight improvement in the position of saltcake quotations are on the easy side, offers being at from £3 7s. 6d. to £3 10s. per ton. Glauber salts are also quiet and easy at £3 2s. 6d. per ton. Bichromate of soda is maintained at 3d. per lb. and a moderate business is being put through. Chlorate of soda is still a slow section, and values are easy, although not actually changed at 2¾d. per lb. Some inquiry is reported in the case of hyposulphite of soda, and values keep up fairly well; commercial is selling at about £9 15s. per ton and photographic at £16 10s. Sulphide of sodium, however, is still showing indications of weakness, and buying interest in this material seems to be at a low ebb; the commercial grade is selling at £8 7s. 6d. and 60-65 per cent. consolidated solid at £10 10s. Alkali is well held at £6 15s. per ton, and a quietly steady trade is being done. Only limited attention is being given to prussiate of soda just now, and at about 4¼d. per lb. the tone is easy. Phosphate of soda is quiet, but prices are fairly steady at from £12 10s. to £12 15s. per ton.

Probably the most active of the potash products are carbonate and caustic, in both of which a fair trade is being done, the former at about £27 per ton and the latter at £31. Only a comparatively quiet demand is reported in the case of yellow prussiate of potash and the tendency is easy, with current values ranging from 6½d. to 6⅝d. per lb. Permanganate of potash is in limited request, with B.P. material offering at about 6½d. per lb. and commercial at 5d. Bichromate of potash remains fairly steady at about 4⅛d. per lb., and a moderate business is being put through. There has been no improvement in the position of chlorate of potash, and at 2⅞d. to 3d. per lb. values are still displaying signs of weakness.

Inquiry for sulphate of copper on this market has been quieter this week; offers of this material are at £24 10s. to £25 per ton, f.o.b. With regard to arsenic interest in this is still fairly good, and prices are steady at round £17 10s. per ton, at the mines, for white powdered, Cornish makes. Acetate of lime is not particularly active, but with prompt offers rather scarce values are firm at £15 10s. per ton for grey and £8 15s. for brown. The acetates of lead are on the slow side, but there has been little movement of prices, white acetate being quoted at about £42 per ton and brown at £40. In the case of nitrate of lead the demand is limited, but prices are maintained at round £38 per ton.

Acids and Tar Products

From 3d. to 3¼d. per lb. is being quoted here this week for oxalic acid and a moderate inquiry is reported. There is a continued easy feeling about citric acid and buying interest is slow; current values range from 1s. 6½d. to 1s. 6¾d. per lb. With regard to tartaric acid here again there is not much business passing and prices are weak at 1s. 3d. per lb. Acetic acid is well held at £37 per ton for the 80 per cent. commercial and £66 to £67 for the glacial quality.

There is still a fair display of interest in creosote oil for shipment and values are firm at up to 7¾d. per gallon. Pitch is quiet just now and to some extent quotations are nominal at about £4 10s. per ton, f.o.b. Carbolic acid crystals are steady but in quiet demand at 8d. per lb., with crude quality quoted at about 2s. 6d. per gallon. Solvent naphtha is dull and weak at 11½d. to 1s. per gallon.

Who Discovered Hydrogen and Oxygen?

A sixteenth century manuscript based on pre-Christian sources of information recently found in India discloses a knowledge of hydrogen and oxygen, according to an announcement by the American Chemical Society. "Internal evidence indicates its authenticity," it is declared. The announcement is based upon researches by Mr. V. R. Kakatnur, a member of the Society, who at Detroit recently presented to scientists from all over the country a translation of the manuscript in a paper entitled "Are Cavendish and Priestley the First Discoverers of Hydrogen and Oxygen?" In September, 1926, the American Chemical Society celebrated the discovery of oxygen by Joseph Priestley with a pilgrimage to Priestley's home at Northumberland, Pa. Henry Cavendish, an Englishman, 1731-1810, is credited with being the first to recognise hydrogen, his discoveries being made known in papers to the Royal Society.

The term "chemistry" and the names of metals, toilet articles, textile fibres, dyes, precious stones, perfumes, etc., have been traced from hieroglyphic records, and the names, analysed by the methods of linguistic research, disclose an Aryan origin, according to Mr. Kakatnur. "Historical, archæological, mythological, ethnological, and agricultural evidence," he claims, "supports the same conclusion." Mr. Earle R. Caley, a science teacher in the high school of Leroy, O., asserts in a report to the History of Chemistry Section that the earliest isolation and knowledge of metallic mercury can be set farther back than most historians of chemistry have generally believed. Apparently the only compound of mercury known to the ancients, he says, was the sulphide, used as a pigment.

A Century of Aluminium

This year marks the centenary of the discovery of aluminium, which was first produced in 1827 by the German Wohler. Although aluminium is one of the most widespread of metals, it was not made use of until a hundred years ago owing to the difficulty that was encountered in attempting to separate it from minerals containing it. Wohler's success in extracting the metal in 1827 was, however, far removed from extraction on a commercial scale, and, for the next thirty years, Wohler, Deville, and other metallurgists carried out much research with this end in view.

When, in 1855, Deville exhibited at the Paris Exhibition his "silver made from clay," the product began to attract widespread attention, states a writer in the *Manchester Guardian*, and during the two succeeding generations the manufacture and popularity of the metal increased by leaps and bounds. Britain has played a large part in the development of the industry, and the hydro-electric scheme now being carried through in Scotland is designed to permit of considerable expansion of the works of the British Aluminium Co. at Kinlochleven.

Sulphur Dioxide in Food

The determination of sulphur dioxide in food forms the subject of the Ministry of Health Report on Public Health, No. 43, published by H.M. Stationery Office (1s. 3d. net).

Benzoic acid and sulphur dioxide are the only preservatives now permitted to be used in foods and drinks. Report 39 of the series has dealt with the determination of benzoic acid, and the present Report deals with the determination of sulphur dioxide, on similar lines.

The total amount of sulphur dioxide permitted in various foods is specified by the Public Health Regulations, but no distinction is made between free and combined sulphurous acid.

It is important to know the nature and extent of the combination between sulphur dioxide and certain constituents of food, as the presence of comparatively stable compounds with sulphur dioxide will affect the determinations unless precautions are taken. Sulphur dioxide is separated from combination on the addition of alkali or on distillation with acid. Gravimetric determination of the barium sulphate give accurate results in practically all cases.

Company News

J. MANDLEBERG.—The directors have declared an interim dividend of 6d. per share, less tax.

ENGLISH MARGARINE WORKS.—The directors have declared an interim dividend on the cumulative participating preference shares at the rate of 7 per cent. per annum, less tax at 4s. in £, in respect of the six months ended June, 1927.

AMERICAN CYANAMID CO.—For the year ended June 30 last, the report shows a net income of $1,356,231, to which has to be added surplus for previous year, $1,362,173, making a total of $2,718,405 to be dealt with. Dividends on the 6 per cent. preferred stock and on the common stock absorbed $1,954,021, and, after writing off $120,924 for abandoned experimental plants and research expenses, and deducting $3,385 for miscellaneous adjustments, the surplus at June 30 was $1,836,482.

B. LAPORTE, LTD.—The net profit for the year ended June 30 last amounted to £11,460, to which must be added a balance of £9,815 brought forward, making a total of £21,275. Dividends on the preference shares, already paid, absorb £9,660, and it is proposed to allocate the balance of £11,615 as follows :—To pay a dividend on the ordinary shares at the rate of 6 per cent. per annum, less income tax, and to carry forward £6,095 to the next account. The annual meeting will be held at Luton, on September 15, at 11 a.m.

TAYLORS (CASH CHEMISTS) TRUST, LTD.—It is announced that this company is making an issue of new one-shilling deferred ordinary shares at par. The company was formed last February to acquire the whole of the issued ordinary share capital of Taylors Drug Company (Limited), and the whole of the deferred ordinary shares of Pritchard and Constance (Manufacturing) (Limited), and a public issue was made of 400,000 7½ per cent. cumulative preferred ordinary shares of £1 each, and a similar number of deferred ordinary shares of 1s. each at par.

BRITISH GLUES AND CHEMICALS, LTD.—The accounts for the year ended May 31, 1927, disclose a considerably reduced deficit as compared with the previous year. The loss this time, after allowance has been made for depreciation (£32,216) and bad and doubtful debts, works out at £12,761. Deducting the £7,019 at credit of profit and loss at May 31, 1926, the debit balance to be carried forward is £5,742. The directors in their report, say they regret the loss sustained. The year, including six months of the coal strike, was one of exceptional difficulty, and only the most strenuous efforts prevented a much heavier loss. The annual meeting will be held at Cannon Street Hotel, London, on September 14, at 12 noon.

AUSTRALIAN CARBIDE CO.—The directors announce that they are unable to pay the interim dividend on the preferred ordinary shares due September 1 last. The company took over control of business in Tasmania on April 25, 1927, being date upon which the final instalment of the purchase price was paid to the Government of Tasmania as vendors. In view of time that has since elapsed being so short, the board has not yet received from advisory board in Tasmania the accounts for the period since incorporation, but it is mentioned that the particulars at present to hand are unsatisfactory, and discussions are taking place with Government of Tasmania on various points arising therefrom. In the meantime, the works are being operated under the active superintendence of the advisory board.

INTERNATIONAL HOLDINGS AND INVESTMENT CO.—The revenue account for the year ended June 30 last shows that, after providing for debenture interest, debenture stockholders' participation in profits, and all other charges, the net credit balance amounted to £55,547, to which is added £6,152 brought forward. It is proposed to pay a dividend on the 1s. shares of 9d. per share, less tax, on 1,060,500 ordinary shares ranking for a full dividend ; of one half of 9d. per share, less tax, on 58,530 ordinary shares, and of 3-20ths of 9d. per share, less tax, on 4,242,000 ordinary shares. These dividends absorb £51,782, leaving £9,917 to be carried forward, subject to directors' additional remuneration. In September, 1926, the name of the company was changed from the Cellulose Holding and Investment Company, and the authorised capital was increased from £55,000 to £500,000 by the creation of 8,900,000 ordinary shares of 1s. each.

UNITED INDIGO AND CHEMICAL CO., LTD.—The report of the directors for the twelve months ended June 30 last states that after providing for depreciation of plant and machinery, bad debts, directors' remuneration, and all other charges, there remains a profit, including £14,170 brought forward from last year's account, of £36,063. From this sum dividends on the preference shares and on the ordinary shares, at the rate of 5 per cent. per annum, already paid, have to be deducted, leaving a balance of £26,376. At a meeting of the directors held on August 23, it was decided to recommend payment of the following dividends forthwith, viz. :—5 per cent. per annum for the six months ended June 30, 1927, on the ordinary shares, subject to income tax at 4s. in the £ ; a further dividend of 3¾ per cent., less income tax at 4s. in the £, on the ordinary shares, making 8¾ per cent. for the year ended June 30, 1927 ; also a further dividend of 3¾ per cent., less income tax at 4s. in the £, on the preference shares, making 8¾ per cent. for the year ended June 30, 1927 ; and that the transfer books of the company be closed from September 5 to 14 inclusive. The dividends will be payable on September 16, 1927. A sum of £15,282 is to be carried forward to next year's account. The annual meeting will be held at 60, Spring Gardens, Manchester, on September 14, at 11 a.m.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to September 24, 1927.

"VULCOID."

482,423. Class 1. Paints, varnishes, enamels, dry colours, distempers, japans, lacquers, anti-corrosive and anti-fouling compositions and anti-corrosive oils. Pinchin, Johnson and Co., Ltd., General Buildings, Aldwych, London, W.C.2 ; varnish, colour and paint manufacturers. July 15, 1927. (To be associated, Sect. 24.)

"VULCOIL."

482,424. Class 1. Paints, varnishes, enamels, dry colours, distempers, japans, lacquers, anti-corrosive and anti-fouling compositions and anti-corrosive oils. Pinchin, Johnson and Co., Ltd., General Buildings, Aldwych, London, W.C.2 ; varnish, colour and paint manufacturers. July 15, 1927. (To be associated, Sect. 24.)

Opposition to the Registration of the following Trade Marks can be lodged up to September 30, 1927.

SOLVAY

Registration of this Trade Mark shall give no right to the exclusive use of the word " Solvay."

PRAESTABIT.

No. 481,734. Class 4. Raw, or partly prepared, vegetable, animal, and mineral substances used in manufactures. Chemische Fabrik Stockhausen and Cie Kommanditgesellschaft (a Kommanditgesellschaft organised under the laws of Germany, personally responsible partner, Hans Stockhausen), Baekerpfad 25, Krefeld, Germany ; manufacturers. June 20, 1927. (To be associated, Sect. 24.)

Chemical Trade Inquiry

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICAL AND PHARMACEUTICAL PRODUCTS.—A commission agent at Bogota is desirous of securing the representation of British exporters. (Reference No. 208.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

KALSOMO, LTD., 16a, Long Row, Nottingham, manufacturing chemists. (C.C., 10/9/27.) £22 12s. 11d. July 20.

TIVIOT MANUFACTURING CO., Newtons Whym, Stockport, soap agents. (C.C., 10/9/27.) £49 3s. July 29.

WARD, Horace William, Dudley, chemical works, Bletchley, chemical manufacturer. (C.C., 10/9/27.) £12 1s. 6d. July 5.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

KALSOMO, LTD., Nottingham, soap manufacturers (M., 10/9/27.) Registered August 24, £900 debentures general charge.

MARSH (R.), LTD., London, E., manufacturers of chemical plant, etc. (M., 10/9/27.) Registered August 25, debenture to Towler and Son, Ltd., Riverbank Works, Sugar House Lane, Stratford, securing all moneys due or to become due to the holders: general charge. *Nil. July 22, 1927.

TOWER DYEING CO., LTD., Radcliffe. (M., 10/9/27.) Registered August 29, £1,500 (not ex.) debenture and a charge collateral thereto, to F. Nelson, Bankfield, St. Margarets, Prestwich, cotton manufacturer; general charge and charged on Tower Works, Potter Street, Radcliffe, with machinery, etc. *Nil. January 14, 1927.

London Gazette, &c.

Company Winding Up Voluntarily

O-PINE-O MANUFACTURING CO., LTD. (C.W.U.V., 10/9/27.) G. W. Burgess, chartered accountant, 14, St. Mary Axe, London, E.C.3, appointed as liquidator, August 24.

Receiverships

BOURNE, JOHNSON AND CO., LTD. (R., 10/9/27.) A. E. Tilley, of 8, Staple Inn, W.C.1, ceased to act as receiver on August 19, 1927.

WARD (H. W. D.), LTD. (R., 10/9/27.) H. Baker, F.C.A., of 4, Broad Street Place, E.C.2, was appointed receiver on August 16, 1927, under powers contained in first mortgage debenture dated December 18, 1925.

New Companies Registered

BRITISH CARBO-UNION, LTD. Registered September 2. Nom. capital, £12,500 in 10,000 6 per cent. cumulative preference shares of £1 each, and 100,000 ordinary shares of 6d. each. Objects: To carry on the business of manufacturers of and dealers in activated carbon and chemicals of all kinds, etc. A subscriber, C. G. Cave, 21, Cholmondeley Avenue, Harlesden, London, N.W.10.

INTERNATIONAL COLFIX, LTD., Bush House, Aldwych, London. Registered on September 3. Nom. capital, £120,000 in 400,000 preferred ordinary shares of 5s. each and 400,000 deferred shares of 1s. each. To acquire patents owned by Colfix, Ltd., for an invention relating to the production of bituminous emulsions and improvements in the production of tar bitumen emulsions and the trade mark or name "Colfix," etc.

MIERES, LTD.—Registered September 1. Nom. capital, £1,200 in £1 shares. Objects: To acquire any invention, relating to the manufacture, application and use of electric power accumulators, to adopt an agreement between the Rev. Father Almeida and Manuel Loring Count de Mieres of the first part, W. Paulton of the second part, and the company of the third part; to carry on business as chemists, distillers, extractors, producers, manufacturers, and suppliers of solid, liquid, powdered, and gaseous substances, including all acids, oils, fats, and waxes, all chemical products, derivatives, and compounds, and by-products or synthetic products, etc. A subscriber: J. Bennett, 2, Bond Court, Walbrook, London, E.C.4.

Nitrocellulose Lacquers in Japan

THE demand for nitrocellulose lacquers in Japan is growing rapidly. The damp climate of the island has an unusually harmful effect upon paints, and the ordinary automobile enamels and varnishes become shabby after a few months' exposure to the elements. Nitrocellulose lacquers on account of offering greater resistance to the action of the elements are becoming increasingly popular, and practically all repainting jobs are now done with lacquers. Import statistics are not available as the local custom statistics do not list the product separately. American nitrocellulose lacquers supply practically the entire demand, and at present three brands of American manufacture appear on the market. A Japanese firm is manufacturing a product but it is stated to be of poor quality. The prices of nitrocellulose lacquers sold by agents to dealers and painters vary considerably, but a standard brand sells for approximately $9.97 per gallon, which includes import duty.

The method of distribution is usually through agents or distributors who have sole agency rights for the country.

There are many small motor painting shops using the lacquers but unable to correspond in English, and having neither the knowledge nor the facilities for conducting import trade. It is necessary, therefore, to sell lacquers through a firm organised to handle the import trade and assume responsibility for the credits advanced to the paint shops.

Belgian Trade with India

THE Department of Overseas Trade states that a co-operative society, to be known as "The Belgian Manufacturers' Corporation," has been formed for the creation of offices in British India for the sale in British India, Burma, and Ceylon of goods manufactured by the associates, and for all commercial operations intended to develop the export of Belgian products to India. An office is to be opened in Brussels for administration. The capital is unlimited, but the minimum is fixed at 675,000 francs, represented by 135 shares, fully subscribed.

Benn Brothers' Other Journals

THE CABINET MAKER.—Special Lancashire Number; Lancashire Trade Review; Liverpool To-day; Preliminary Review of the Wholesale Furniture Exhibition at Manchester; Textiles and Furnishing; Are Exhibitions Worth While?

THE ELECTRICIAN.—"Two-Part Domestic Tariffs," by C. F. Mounsdon, A.M.I.E.E.; "Super Tension Cables," by P. Dunsheath, O.B.E.; "'Selling' Our Salesmen," by C. Sylvester.

THE FRUIT GROWER.—Annual Fruit Tree Planting Issue; "Self- and Cross-Sterility in Fruit Trees," by M. B. Crane; Survey of Fruit Nurseries (illustrated).

GARDENING ILLUSTRATED.—Lifting and Planting Daffodils; "Euctoma Russellianus," by T. Hay, M.V.O., V.M.H.; Tulips to Plant this Autumn; Novelties at Vincent Square (illustrated); The Beekeepers of Buckfast Abbey.

THE GAS WORLD.—The Scientific Mind in Industry; Coal Subjects Discussed at the British Association.

THE HARDWARE TRADE JOURNAL.—Annual Heating Number; Latest Devices in Electric, Gas, and Coal Heating Reviewed.

THE TIMBER TRADES JOURNAL.—Polish Timber Trade; R.E.A.S. Summer Meeting; The Situation in the Mississippi Valley; Forests of the Balkan Peninsula; The Deal Frame.